Title 51 WAC

GENERAL ADMINISTRATION, DEPARTMENT OF (BUILDING CODE COUNCIL)

(Formerly: CTED (Building Code Council))

Chapters

51-11 **Washington State Energy Code 2009 edition.**

51-50 **State Building Code adoption and amendment of the 2009 edition of the International Building Code.**

51-51 **State Building Code adoption and amendment of the 2009 edition of the International Residential Code.**

51-52 **State Building Code adoption and amendment of the 2009 edition of the International Mechanical Code.**

51-54 **State Building Code adoption and amendment of the 2009 edition of the International Fire Code.**

51-56 **State Building Code adoption and amendment of the 2009 edition of the Uniform Plumbing Code.**

51-57 **State Building Code adoption and amendment of Appendix A, B and Appendix I of the 2009 edition of the Uniform Plumbing Code.**

DISPOSITION OF CHAPTERS FORMERLY CODIFIED IN THIS TITLE

Chapter 51-13
VENTILATION AND INDOOR AIR QUALITY 2006 EDITION

51-13-100 Chapter 1—Administration and enforcement. [Statutory Authority: RCW 19.27.190. 91-01-102, § 51-13-100, filed 12/18/90, effective 7/1/91.] Repealed by 10-03-102, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.190, 19.27.074 and 19.27.020.

51-13-101 Scope and general requirements. [Statutory Authority: RCW 19.27.190, 19.27.020. 01-02-099, § 51-13-101, filed 1/3/01, effective 7/1/01. Statutory Authority: RCW 19.27.190(2) and 1992 c 132. 93-02-056, § 51-13-101, filed 1/6/93, effective 7/1/93. Statutory Authority: RCW 19.27.190. 91-01-102, § 51-13-101, filed 12/18/90, effective 7/1/91.] Repealed by 10-03-102, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.190, 19.27.074 and 19.27.020.

51-13-102 Alternate systems and materials method of design, construction and installation. [Statutory Authority: RCW 19.27.190. 91-01-102, § 51-13-102, filed 12/18/90, effective 7/1/91.] Repealed by 10-03-102, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.190, 19.27.074 and 19.27.020.

51-13-103 Plans and specifications. [Statutory Authority: RCW 19.27.190. 91-01-102, § 51-13-103, filed 12/18/90, effective 7/1/91.] Repealed by 10-03-102, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.190, 19.27.074 and 19.27.020.

51-13-104 Enforcement and inspections. [Statutory Authority: RCW 19.27.190. 91-01-102, § 51-13-104, filed 12/18/90, effective 7/1/91.] Repealed by 10-03-102, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.190, 19.27.074 and 19.27.020.

51-13-105 Validity. [Statutory Authority: RCW 19.27.190. 91-01-102, § 51-13-105, filed 12/18/90, effective 7/1/91.] Repealed by 10-03-102, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.190, 19.27.074 and 19.27.020.

51-13-106 Conflicts with other codes. [Statutory Authority: RCW 19.27.190, 19.27.020, and chapters 19.27 and 34.05 RCW. 04-07-192, § 51-13-106, filed 3/24/04, effective 7/1/04. Statutory Authority: RCW 19.27.190 and 19.27.020. 98-02-047, § 51-13-106, filed 1/5/98, effective 7/1/98. Statutory Authority: RCW 19.27.190. 95-01-128, § 51-13-106, filed 12/21/94, effective 6/30/95; 91-01-102, § 51-13-106, filed 12/18/90, effective 7/1/91.] Repealed by 10-03-102, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.190, 19.27.074 and 19.27.020.

51-13-107 Violations. [Statutory Authority: RCW 19.27.190. 91-01-102, § 51-13-107, filed 12/18/90, effective 7/1/91.] Repealed by 10-03-102, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.190, 19.27.074 and 19.27.020.

51-13-108 Liability. [Statutory Authority: RCW 19.27.190. 91-01-102, § 51-13-108, filed 12/18/90, effective 7/1/91.] Repealed by 10-03-102, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.190, 19.27.074 and 19.27.020.

51-13-200 Definitions. [Statutory Authority: RCW 19.27.190. 91-01-102, § 51-13-200, filed 12/18/90, effective 7/1/91.] Repealed by 10-03-102, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.190, 19.27.074 and 19.27.020.

51-13-201 General. [Statutory Authority: RCW 19.27.190, 19.27.020, and chapters 19.27 and 34.05 RCW. 04-07-192, § 51-13-201, filed 3/24/04, effective 7/1/04. Statutory Authority: RCW 19.27.190. 95-01-128, § 51-13-201, filed 12/21/94, effective 6/30/95; 91-01-102, § 51-13-201, filed 12/18/90, effective 7/1/91.] Repealed by 10-03-102, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.190, 19.27.074 and 19.27.020.

51-13-202 Definitions.[Statutory Authority: RCW 19.27.190(2) and 1992 c 132. 93-02-056, § 51-13-202, filed 1/6/93, effective 7/1/93. Statutory Authority: RCW 19.27.190. 91-01-102, § 51-13-202, filed 12/18/90, effective 7/1/91.] Repealed by 10-03-102, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.190, 19.27.074 and 19.27.020.

51-13-300 Chapter 3—Ventilation systems. [Statutory Authority: RCW 19.27.190(2) and 1992 c 132. 93-02-056, § 51-13-300, filed 1/6/93, effective 7/1/93. Statutory Authority: RCW 19.27.190. 91-01-102, § 51-13-300, filed 12/18/90, effective 7/1/91.] Repealed by 10-03-102, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.190, 19.27.074 and 19.27.020.

51-13-301 Compliance with this chapter. [Statutory Authority: RCW 19.27.190, 19.27.020. 01-02-099, § 51-13-301, filed 1/3/01, effective 7/1/01. Statutory Authority: RCW 19.27.190. 91-01-102, § 51-13-301, filed 12/18/90, effective 7/1/91.] Repealed by 10-03-102, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.190, 19.27.074 and 19.27.020.

51-13-302 Mechanical ventilation criteria using performance or design methods for Group R Occupancies four stories and less. [Statutory Authority: RCW 19.27.190, 19.27.020, and chapters 19.27 and 34.05 RCW. 04-07-192, § 51-13-302, filed 3/24/04, effective 7/1/04. Statutory Authority: RCW 19.27.190, 19.27.020. 01-02-099, § 51-13-302, filed 1/3/01, effective 7/1/01. Statutory Authority: RCW 19.27.190. 95-01-128, § 51-13-302, filed 12/21/94, effective 6/30/95. Statutory Authority: RCW 19.27.190(2) and 1992 c 132. 93-02-056, § 51-13-302, filed 1/6/93, effective 7/1/93. Statutory Authority: RCW 19.27.190. 91-01-102, § 51-13-302, filed 12/18/90, effective 7/1/91.] Repealed by 10-03-102, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.190, 19.27.074 and 19.27.020.

51-13-303 Mechanical ventilation criteria using prescriptive methods for Group R Occupancies four stories and less. [Statutory Authority: RCW 19.27.190, 19.27.020, and chapters 19.27 and 34.05 RCW. 04-07-192, § 51-13-303, filed 3/24/04, effective 7/1/04. Statutory Authority: RCW 19.27.190, 19.27.020. 01-02-099, § 51-13-303, filed 1/3/01, effective 7/1/01. Statutory Authority: RCW 19.27.190(2) and 1992 c 132. 93-02-056, § 51-13-303, filed 1/6/93, effective 7/1/93. Statutory Authority: RCW 19.27.190. 91-01-102, § 51-13-303, filed 12/18/90, effective 7/1/91.] Repealed by 10-03-102,

filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.190, 19.27.074 and 19.27.020.

51-13-304 Mechanical ventilation criteria and minimum ventilation performance for all other occupancies not covered in sections 302 and 303. [Statutory Authority: RCW 19.27.190, 19.27.020 and chapters 19.27 and 34.05 RCW. 07-01-095, § 51-13-304, filed 12/19/06, effective 7/1/07; 04-07-192, § 51-13-304, filed 3/24/04, effective 7/1/04. Statutory Authority: RCW 19.27.190, 19.27.020. 01-02-099, § 51-13-304, filed 1/3/01, effective 7/1/01. Statutory Authority: RCW 19.27.190. 95-01-128, § 51-13-304, filed 12/21/94, effective 6/30/95. Statutory Authority: RCW 19.27.190(2) and 1992 c 132. 93-02-056, § 51-13-304, filed 1/6/93, effective 7/1/93. Statutory Authority: RCW 19.27.190. 91-01-102, § 51-13-304, filed 12/18/90, effective 7/1/91.] Repealed by 10-03-102, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.190, 19.27.074 and 19.27.020.

51-13-400 Chapter 4—Indoor air quality. [Statutory Authority: RCW 19.27.190. 91-01-102, § 51-13-400, filed 12/18/90, effective 7/1/91.] Repealed by 10-03-102, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.190, 19.27.074 and 19.27.020.

51-13-401 Pollutant source control.[Statutory Authority: RCW 19.27.190(2) and 1992 c 132. 93-02-056, § 51-13-401, filed 1/6/93, effective 7/1/93. Statutory Authority: RCW 19.27.190. 91-01-102, § 51-13-401, filed 12/18/90, effective 7/1/91.] Repealed by 10-03-102, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.190, 19.27.074 and 19.27.020.

51-13-402 Solid fuel burning appliances and fireplaces. [Statutory Authority: RCW 19.27.190, 19.27.020, and chapters 19.27 and 34.05 RCW. 04-07-192, § 51-13-402, filed 3/24/04, effective 7/1/04. Statutory Authority: RCW 19.27.190 and 19.27.020. 98-02-047, § 51-13-402, filed 1/5/98, effective 7/1/98. Statutory Authority: RCW 19.27.190. 95-01-128, § 51-13-402, filed 12/21/94, effective 6/30/95. Statutory Authority: RCW 19.27.190(2) and 1992 c 132. 93-02-056, § 51-13-402, filed 1/6/93, effective 7/1/93. Statutory Authority: RCW 19.27.190. 91-01-102, § 51-13-402, filed 12/18/90, effective 7/1/91.] Repealed by 10-03-102, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.190, 19.27.074 and 19.27.020.

51-13-500 Chapter 5—Radon resistive construction standards. [Statutory Authority: RCW 19.27.190. 91-01-102, § 51-13-500, filed 12/18/90, effective 7/1/91.] Repealed by 10-03-102, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.190, 19.27.074 and 19.27.020.

51-13-501 Scope. [Statutory Authority: RCW 19.27.190 and 19.27.020 and Chapters 19.27 and 34.05 RCW. 07-01-095, § 51-13-501, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.190. 95-01-128, § 51-13-501, filed 12/21/94, effective 6/30/95; 91-01-102, § 51-13-501, filed 12/18/90, effective 7/1/91.] Repealed by 10-03-102, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.190, 19.27.074 and 19.27.020.

51-13-502 Statewide radon requirements. [Statutory Authority: RCW 19.27.190, 19.27.020, and chapters 19.27 and 34.05 RCW. 04-07-192, § 51-13-502, filed 3/24/04, effective 7/1/04. Statutory Authority: RCW 19.27.190 and 19.27.020. 98-02-047, § 51-13-502, filed 1/5/98, effective 7/1/98. Statutory Authority: RCW 19.27.190. 95-01-128, § 51-13-502, filed 12/21/94, effective 6/30/95. Statutory Authority: RCW 19.27.190(2) and 1992 c 132. 93-02-056, § 51-13-502, filed 1/6/93, effective 7/1/93. Statutory Authority: RCW 19.27.190. 91-12-045, § 51-13-502, filed 6/5/91, effective 7/1/91; 91-01-102, § 51-13-502, filed 12/18/90, effective 7/1/91.] Repealed by 10-03-102, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.190, 19.27.074 and 19.27.020.

51-13-503 Radon prescriptive requirements. [Statutory Authority: RCW 19.27.190, 19.27.020, and chapters 19.27 and 34.05 RCW. 04-07-192, § 51-13-503, filed 3/24/04, effective 7/1/04. Statutory Authority: RCW 19.27.190, 19.27.020. 01-02-099, § 51-13-503, filed 1/3/01, effective 7/1/01. Statutory Authority: RCW 19.27.190(2) and 1992 c 132. 93-02-056, § 51-13-503, filed 1/6/93, effective 7/1/93. Statutory Authority: RCW 19.27.190. 91-01-102, § 51-13-503, filed 12/18/90, effective 7/1/91.] Repealed by 10-03-102, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.190, 19.27.074 and 19.27.020.

Chapter 51-19
WASHINGTON STATE HISTORIC BUILDING CODE

51-19-100 Title. [Statutory Authority: RCW 19.27.120 and 19.27.074. 91-01-103, § 51-19-100, filed 12/18/90, effective 7/1/91.] Repealed by 10-03-103, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.120, 19.27.074.

51-19-110 Purpose. [Statutory Authority: RCW 19.27.120 and 19.27.074. 91-01-103, § 51-19-110, filed 12/18/90, effective 7/1/91.] Repealed by 10-03-103, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.120, 19.27.074.

51-19-120 Scope. [Statutory Authority: RCW 19.27.120 and 19.27.074. 91-01-103, § 51-19-120, filed 12/18/90, effective 7/1/91.] Repealed by 10-03-103, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.120, 19.27.074.

51-19-130 Existing uses. [Statutory Authority: RCW 19.27.120 and 19.27.074. 91-01-103, § 51-19-130, filed 12/18/90, effective 7/1/91.] Repealed by 10-03-103, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.120, 19.27.074.

51-19-140 Additions, alterations, and repairs. [Statutory Authority: RCW 19.27.120 and 19.27.074. 91-01-103, § 51-19-140, filed 12/18/90, effective 7/1/91.] Repealed by 10-03-103, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.120, 19.27.074.

51-19-150 Change of occupancy. [Statutory Authority: RCW 19.27.120 and 19.27.074. 91-01-103, § 51-19-150, filed 12/18/90, effective 7/1/91.] Repealed by 10-03-103, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.120, 19.27.074.

51-19-160 Maintenance. [Statutory Authority: RCW 19.27.120 and 19.27.074. 91-01-103, § 51-19-160, filed 12/18/90, effective 7/1/91.] Repealed by 10-03-103, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.120, 19.27.074.

51-19-170 Alternative materials, designs, and methods. [Statutory Authority: RCW 19.27.120 and 19.27.074. 91-01-103, § 51-19-170, filed 12/18/90, effective 7/1/91.] Repealed by 10-03-103, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.120, 19.27.074.

51-19-180 Modifications. [Statutory Authority: RCW 19.27.120 and 19.27.074. 91-01-103, § 51-19-180, filed 12/18/90, effective 7/1/91.] Repealed by 10-03-103, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.120, 19.27.074.

51-19-190 Tests. [Statutory Authority: RCW 19.27.120 and 19.27.074. 91-01-103, § 51-19-190, filed 12/18/90, effective 7/1/91.] Repealed by 10-03-103, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.120, 19.27.074.

51-19-200 Enforcement. [Statutory Authority: RCW 19.27.120 and 19.27.074. 91-01-103, § 51-19-200, filed 12/18/90, effective 7/1/91.] Repealed by 10-03-103, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.120, 19.27.074.

51-19-210 Permits. [Statutory Authority: RCW 19.27.120 and 19.27.074. 91-01-103, § 51-19-210, filed 12/18/90, effective 7/1/91.] Repealed by 10-03-103, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.120, 19.27.074.

51-19-220 Inspection. [Statutory Authority: RCW 19.27.120 and 19.27.074. 91-01-103, § 51-19-220, filed 12/18/90, effective 7/1/91.] Repealed by 10-03-103, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.120, 19.27.074.

51-19-230 Repairs. [Statutory Authority: RCW 19.27.120 and 19.27.074. 91-01-103, § 51-19-230, filed 12/18/90, effective 7/1/91.] Repealed by 10-03-103, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.120, 19.27.074.

51-19-240 Relocated buildings. [Statutory Authority: RCW 19.27.120 and 19.27.074. 91-01-103, § 51-19-240, filed 12/18/90, effective 7/1/91.] Repealed by 10-03-103, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.120, 19.27.074.

51-19-250 Right of entry. [Statutory Authority: RCW 19.27.120 and 19.27.074. 91-01-103, § 51-19-250, filed 12/18/90, effective 7/1/91.] Repealed by 10-03-103, filed 1/20/10,

effective 7/1/10. Statutory Authority: RCW 19.27.120, 19.27.074.

51-19-260 Liability. [Statutory Authority: RCW 19.27.120 and 19.27.074. 91-01-103, § 51-19-260, filed 12/18/90, effective 7/1/91.] Repealed by 10-03-103, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.120, 19.27.074.

51-19-270 Unsafe buildings or structures. [Statutory Authority: RCW 19.27.120 and 19.27.074. 91-01-103, § 51-19-270, filed 12/18/90, effective 7/1/91.] Repealed by 10-03-103, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.120, 19.27.074.

51-19-280 Appeals. [Statutory Authority: RCW 19.27.120 and 19.27.074. 91-01-103, § 51-19-280, filed 12/18/90, effective 7/1/91.] Repealed by 10-03-103, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.120, 19.27.074.

51-19-300 Definitions. [Statutory Authority: RCW 19.27.120 and 19.27.074. 91-01-103, § 51-19-300, filed 12/18/90, effective 7/1/91.] Repealed by 10-03-103, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.120, 19.27.074.

51-19-400 General. [Statutory Authority: RCW 19.27.120 and 19.27.074. 91-01-103, § 51-19-400, filed 12/18/90, effective 7/1/91.] Repealed by 10-03-103, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.120, 19.27.074.

51-19-410 Exit systems. [Statutory Authority: RCW 19.27.120 and 19.27.074. 91-01-103, § 51-19-410, filed 12/18/90, effective 7/1/91.] Repealed by 10-03-103, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.120, 19.27.074.

51-19-420 Structural safety. [Statutory Authority: RCW 19.27.120 and 19.27.074. 91-01-103, § 51-19-420, filed 12/18/90, effective 7/1/91.] Repealed by 10-03-103, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.120, 19.27.074.

51-19-430 Weather protection. [Statutory Authority: RCW 19.27.120 and 19.27.074. 91-01-103, § 51-19-430, filed 12/18/90, effective 7/1/91.] Repealed by 10-03-103, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.120, 19.27.074.

51-19-440 Other safety features. [Statutory Authority: RCW 19.27.120 and 19.27.074. 91-01-103, § 51-19-440, filed 12/18/90, effective 7/1/91.] Repealed by 10-03-103, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.120, 19.27.074.

51-19-450 Light, ventilation, sanitation, smoke detectors, and heating. [Statutory Authority: RCW 19.27.120 and 19.27.074. 91-01-103, § 51-19-450, filed 12/18/90, effective 7/1/91.] Repealed by 10-03-103, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.120, 19.27.074.

51-19-460 Plumbing. [Statutory Authority: RCW 19.27.120 and 19.27.074. 91-01-103, § 51-19-460, filed 12/18/90, effective 7/1/91.] Repealed by 10-03-103, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.120, 19.27.074.

51-19-500 Survey or evaluation. [Statutory Authority: RCW 19.27.120 and 19.27.074. 91-01-103, § 51-19-500, filed 12/18/90, effective 7/1/91.] Repealed by 10-03-103, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.120, 19.27.074.

51-19-510 Alternatives. [Statutory Authority: RCW 19.27.120 and 19.27.074. 91-01-103, § 51-19-510, filed 12/18/90, effective 7/1/91.] Repealed by 10-03-103, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.120, 19.27.074.

51-19-600 General. [Statutory Authority: RCW 19.27.120 and 19.27.074. 91-01-103, § 51-19-600, filed 12/18/90, effective 7/1/91.] Repealed by 10-03-103, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.120, 19.27.074.

51-19-610 Heights and area. [Statutory Authority: RCW 19.27.120 and 19.27.074. 91-01-103, § 51-19-610, filed 12/18/90, effective 7/1/91.] Repealed by 10-03-103, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.120, 19.27.074.

51-19-620 Fire safety. [Statutory Authority: RCW 19.27.120 and 19.27.074. 91-01-103, § 51-19-620, filed 12/18/90, effective 7/1/91.] Repealed by 10-03-103, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.120, 19.27.074.

51-19-630 Property protection. [Statutory Authority: RCW 19.27.120 and 19.27.074. 91-01-103, § 51-19-630, filed 12/18/90, effective 7/1/91.] Repealed by 10-03-103, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.120, 19.27.074.

51-19-640 Structural safety. [Statutory Authority: RCW 19.27.120 and 19.27.074. 91-01-103, § 51-19-640, filed 12/18/90, effective 7/1/91.] Repealed by 10-03-103, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.120, 19.27.074.

51-19-650 Light and ventilation. [Statutory Authority: RCW 19.27.120 and 19.27.074. 91-01-103, § 51-19-650, filed 12/18/90, effective 7/1/91.] Repealed by 10-03-103, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.120, 19.27.074.

51-19-660 Flame spread reduction. [Statutory Authority: RCW 19.27.120 and 19.27.074. 91-01-103, § 51-19-660, filed 12/18/90, effective 7/1/91.] Repealed by 10-03-103, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.120, 19.27.074.

51-19-670 Roof coverings. [Statutory Authority: RCW 19.27.120 and 19.27.074. 91-01-103, § 51-19-670, filed 12/18/90, effective 7/1/91.] Repealed by 10-03-103, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.120, 19.27.074.

51-19-700 General. [Statutory Authority: RCW 19.27.120 and 19.27.074. 91-01-103, § 51-19-700, filed 12/18/90, effective 7/1/91.] Repealed by 10-03-103, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.120, 19.27.074.

51-19-710 Building access and use. [Statutory Authority: RCW 19.27.120 and 19.27.074. 91-01-103, § 51-19-710, filed 12/18/90, effective 7/1/91.] Repealed by 10-03-103, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.120, 19.27.074.

51-19-800 General. [Statutory Authority: RCW 19.27.120 and 19.27.074. 91-01-103, § 51-19-800, filed 12/18/90, effective 7/1/91.] Repealed by 10-03-103, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.120, 19.27.074.

51-19-810 Alternative energy conservation provisions. [Statutory Authority: RCW 19.27.120 and 19.27.074. 91-01-103, § 51-19-810, filed 12/18/90, effective 7/1/91.] Repealed by 10-03-103, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.120, 19.27.074.

51-19-900 Appendix A. [Statutory Authority: RCW 19.27.120 and 19.27.074. 91-01-103, § 51-19-900, filed 12/18/90, effective 7/1/91.] Repealed by 10-03-103, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.120, 19.27.074.

51-19-901 Appendix B—Bibliography. [Statutory Authority: RCW 19.27.120 and 19.27.074. 91-01-103, § 51-19-901, filed 12/18/90, effective 7/1/91.] Repealed by 10-03-103, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.120, 19.27.074.

Chapter 51-11 WAC

WASHINGTON STATE ENERGY CODE 2009 EDITION

WAC

51-11-0101 Section 101—Scope and general requirements.
51-11-0105 Inspections and enforcement.
51-11-0201 Scope.
51-11-0302 Thermal design parameters.
51-11-0303 Mechanical ventilation.
51-11-0401 Scope.
51-11-0402 Systems analysis.
51-11-0501 Scope.
51-11-0502 Building envelope requirements.
51-11-0503 Mechanical systems.
51-11-0504 Domestic water systems.
51-11-0505 Lighting.
51-11-0525 Equation 1—Single-family residential.
51-11-0527 Equation 3—Single-family residential.
51-11-0530 Table 5-1.
51-11-0540 Table 5-11.
51-11-0541 Table 5-12.
51-11-0601 Scope.
51-11-0602 Building envelope requirements for single-family residential.
51-11-0603 Mechanical systems for single-family residential.

51-11-0604 Domestic water systems.
51-11-0625 Table 6-1.
51-11-0701 Scope.
51-11-0800 Section 0800—Suggested software for chapter 4 systems analysis approach.
51-11-0900 Chapter 0900—Additional residential energy efficiency requirements.
51-11-1001 Section 1001 General.
51-11-1004 Section 1004: Floors over unconditioned space.
51-11-1005 Section 1005: Above-grade walls.
51-11-1006 Section 1006 Default U-factors for glazing and doors.
51-11-1007 Section 1007 Ceilings.
51-11-1008 Section 1008 Air infiltration.
51-11-1009 Section 1009 Mass.
51-11-1120 Scope.
51-11-1131 Additions to existing buildings.
51-11-1132 Alterations and repairs.
51-11-1133 Change of occupancy or use.
51-11-1135 Commissioning.
51-11-1141 Plans and specifications.
51-11-1200 Section 1201—General.
51-11-1310 General requirements.
51-11-1311 Insulation.
51-11-1312 Glazing and doors.
51-11-1313 Moisture control.
51-11-1314 Air leakage.
51-11-1322 Opaque envelope.
51-11-1323 Glazing.
51-11-1331 General.
51-11-1332 Component U-factors.
51-11-1334 Solar heat gain coefficient rate calculations.
51-11-1402 Mechanical ventilation.
51-11-1410 General requirements.
51-11-1411 HVAC equipment performance requirements.
51-11-1412 Controls.
51-11-1413 Economizers.
51-11-1414 Ducting systems.
51-11-1416 Commissioning and completion requirements.
51-11-1421 System type.
51-11-1423 Economizers.
51-11-1431 System type.
51-11-1432 Controls.
51-11-1433 Economizers.
51-11-1435 Simultaneous heating and cooling.
51-11-1436 Heat recovery.
51-11-1437 Electric motor efficiency.
51-11-1438 System criteria.
51-11-1439 Exhaust systems.
51-11-1440 Domestic water systems.
51-11-1444 Conservation of water and pumping energy.
51-11-1445 Heat recovery for domestic water systems.
51-11-1446 Domestic hot water meters.
51-11-1454 Pool covers and insulation.
51-11-1460 Cold storage.
51-11-1510 General requirements.
51-11-1512 Exempt lighting.
51-11-1513 Lighting controls.
51-11-1521 Prescriptive interior lighting requirements.
51-11-1530 Lighting power allowance option.
51-11-1531 Interior lighting power allowance.
51-11-1532 Exterior lighting power allowance.
51-11-99901 Section 1—General.
51-11-99902 Section 2—Simulation general requirements.
51-11-99903 Section 3—Calculation of the proposed and baseline building performance.
51-11-99904 Section 4—Suggested software for systems analysis approach.

WAC 51-11-0101 Section 101—Scope and general requirements.

101.1 Title: Chapters 1 through 10 of this Code shall be known as the "Washington State Single-Family Residential Energy Code" and may be cited as such; and will be referred to herein as "this Code."

101.2 Purpose and Intent: The purpose of this Code is to provide minimum standards for new or altered buildings and structures or portions thereof to achieve efficient use and conservation of energy.

The purpose of this Code is not to create or otherwise establish or designate any particular class or group of persons who will or should be especially protected or benefitted by the terms of this Code.

It is intended that these provisions provide flexibility to permit the use of innovative approaches and techniques to achieve efficient use and conservation of energy. These provisions are structured to permit compliance with the intent of this Code by any one of the following three paths of design:

1. A systems analysis approach for the entire building and its energy-using sub-systems which may utilize renewable energy sources, Chapters 4 and 9.

2. A component performance approach for various building elements and mechanical systems and components, Chapters 5 and 9.

3. A prescriptive requirements approach, Chapters 6 and 9.

Compliance with any one of these approaches meets the intent of this Code. This Code is not intended to abridge any safety or health requirements required under any other applicable codes or ordinances.

The provisions of this Code do not consider the efficiency of various energy forms as they are delivered to the building envelope. A determination of delivered energy efficiencies in conjunction with this Code will provide the most efficient use of available energy in new building construction.

101.3 Scope: This Code sets forth minimum requirements for the design of new buildings and structures that provide facilities or shelter for residential occupancies by regulating their exterior envelopes and the selection of their mechanical systems, domestic water systems, electrical distribution and illuminating systems, and equipment for efficient use and conservation of energy.

Buildings shall be designed to comply with the requirements of either Chapter 4, 5, or 6 of this Code and the additional energy efficiency requirements included in Chapter 9 of this Code.

Spaces within the scope of Section R101.2 of the International Residential Code shall comply with Chapters 1 through 10 of this Code. All other spaces, including other Group R Occupancies, shall comply with Chapters 11 through 20 of this Code. Chapter 2 (Definitions), Chapter 7 (Standards), and Chapter 10 (default heat loss coefficients), are applicable to all building types.

101.3.1 Exempt Buildings: Buildings and structures or portions thereof meeting any of the following criteria shall be exempt from the building envelope requirements of Sections 502 and 602, but shall comply with all other requirements for mechanical systems and domestic water systems.

101.3.1.1: Buildings and structures or portions thereof whose peak design rate of energy usage is less than three and four tenths (3.4) Btu/h per square foot or one point zero (1.0) watt per square foot of floor area for space conditioning requirements.

101.3.1.2: Buildings and structures or portions thereof which are neither heated according to the definition of heated space in Chapter 2, nor cooled by a nonrenewable energy source, provided that the nonrenewable energy use for space conditioning complies with requirements of Section 101.3.1.1.

101.3.1.3: Greenhouses isolated from any conditioned space and not intended for occupancy.

101.3.1.4: The provisions of this code do not apply to the construction, alteration, or repair of temporary worker housing except as provided by rule adopted under chapter 70.114A RCW or chapter 37, Laws of 1998 (SB 6168). "Temporary worker housing" means a place, area, or piece of land where sleeping places or housing sites are provided by an employer for his or her employees or by another person, including a temporary worker housing operator, who is providing such accommodations for employees, for temporary, seasonal occupancy, and includes "labor camps" under RCW 70.54.110.

101.3.2 Application to Existing Buildings: Additions, historic buildings, changes of occupancy or use, and alterations or repairs shall comply with the requirements in the subsections below.

EXCEPTION: The building official may approve designs of alterations or repairs which do not fully conform with all of the requirements of this Code where in the opinion of the building official full compliance is physically impossible and/or economically impractical and:
1. The alteration or repair improves the energy efficiency of the building; or
2. The alteration or repair is energy efficient and is necessary for the health, safety, and welfare of the general public.
In no case, shall building envelope requirements or mechanical system requirements be less than those requirements in effect at the time of the initial construction of the building.

101.3.2.1 Additions to Existing Buildings: Additions to existing buildings or structures may be made to such buildings or structures without making the entire building or structure comply, provided that the new additions shall conform to the provisions of this Code.

EXCEPTION: New additions which do not fully comply with the requirements of this Code and which have a floor area which is less than seven hundred fifty square feet shall be approved provided that improvements are made to the existing occupancy to compensate for any deficiencies in the new addition. Compliance shall be demonstrated by either systems analysis or component performance calculations. The nonconforming addition and upgraded, existing occupancy shall have an energy budget or Target UA which is less than or equal to the unimproved existing building (minus any elements which are no longer part of the building envelope once the addition is added), with the addition designed to comply with this Code.

101.3.2.2 Historic Buildings: The building official may modify the specific requirements of this Code for historic buildings and require in lieu thereof alternate requirements which will result in a reasonable degree of energy efficiency. This modification may be allowed for those buildings which have been specifically designated as historically significant by the state or local governing body, or listed in The National Register of Historic Places or which have been determined to be eligible for listing.

101.3.2.3 Change of Occupancy or Use:

Any space not within the scope of Section 101.3 which is converted to space that is within the scope of Section 101.3 shall be brought into full compliance with this Code.

101.3.2.4 Alterations and Repairs: All alterations and repairs to buildings or portions thereof originally constructed subject to the requirements of this Code shall conform to the provisions of this Code without exception. For all other existing buildings, initial tenant alterations shall comply with the new construction requirements of this Code. Other alterations and repairs may be made to existing buildings and moved buildings without making the entire building comply with all of the requirements of this Code for new buildings, provided the requirements of Sections 101.3.2.5 through 101.3.2.8 are met.

101.3.2.5 Building Envelope: The result of the alterations or repairs both:

1. Improves the energy efficiency of the building, and

2. Complies with the overall average thermal transmittance values of the elements of the exterior building envelope in Table 5-1 of Chapter 5 or the nominal R-values and glazing requirements of the reference case in Tables 6-1 and 6-2.

EXCEPTIONS: 1. Untested storm windows may be installed over existing glazing for an assumed U-factor of 0.90, however, where glass and sash are being replaced, glazing shall comply with the appropriate reference case in Tables 6-1 and 6-2.

2. Where the structural elements of the altered portions of roof/ceiling, wall or floor are not being replaced, these elements shall be deemed to comply with this Code if all existing framing cavities which are exposed during construction are filled to the full depth with batt insulation or insulation having an equivalent nominal R-value. 2x4 framed walls shall be insulated to a minimum of R-15 and 2x6 framed walls shall be insulated to a minimum of R-21. Roof/ceiling assemblies shall maintain the required space for ventilation. Existing walls and floors without framing cavities need not be insulated. Existing roofs shall be insulated to the requirements of this Code if

a. The roof is uninsulated or insulation is removed to the level of the sheathing, or

b. All insulation in the roof/ceiling was previously installed exterior to the sheathing or nonexistent.

101.3.2.6 Mechanical Systems: Those parts of systems which are altered or replaced shall comply with Section 503 of this Code. When a space-conditioning system is altered by the installation or replacement of space-conditioning equipment (including replacement of the air handler, outdoor condensing unit of a split system air conditioner or heat pump, cooling or heating coil, or the furnace heat exchanger), the duct system that is connected to the new or replacement space-conditioning equipment shall be sealed, as confirmed through field verification and diagnostic testing in accordance with procedures for duct sealing of existing duct systems as specified in RS-33. The test results shall confirm at least one of the following performance requirements:

1. The measured total duct leakage shall be less than or equal to 8 percent of the conditioned floor area, measured in CFM @ 25 Pascals; or

2. The measured duct leakage to outside shall be less than 6 percent of the conditioned floor area, measured in CFM @ 25 Pascals; or

3. The measured duct leakage shall be reduced by more than 50 percent relative to the measured leakage prior to the installation or replacement of the space conditioning equipment and a visual inspection including a smoke test shall demonstrate that all accessible leaks have been sealed; or

4. If it is not possible to meet the duct requirements of 1, 2 or 3, all accessible leaks shall be sealed and verified through a visual inspection and through a smoke test by a certified third party.

EXCEPTIONS:
1. Duct systems that are documented to have been previously sealed as confirmed through field verification and diagnostic testing in accordance with procedures in RS-33.
2. Ducts with less than 40 linear feet in unconditioned spaces.
3. Existing duct systems constructed, insulated or sealed with asbestos.

101.3.2.7 Domestic Water Systems: Those parts of systems which are altered or replaced shall comply with section 504.

101.3.2.8 Lighting: Alterations shall comply with Sections 505 and 1132.3.

101.3.3 Mixed Occupancy: When a building houses more than one occupancy, each portion of the building shall conform to the requirements for the occupancy housed therein. Where approved by the building official, where minor accessory uses do not occupy more than ten percent of the area of any floor of a building, the major use may be considered the building occupancy.

101.4 Amendments by Local Government: Except as provided in RCW 19.27A.020(7), this Code shall be the maximum and minimum energy code for single-family residential in each town, city and county.

[Statutory Authority: RCW 19.27A.025, 19.27A.045. 10-03-115, 10-13-113 and 10-22-056, § 51-11-0101, filed 1/20/10, 6/21/10 and 10/28/10, effective 1/1/11. Statutory Authority: RCW 19.27A.022, 19.27A.025, 19.27A.045, and chapters 19.27 and 34.05 RCW. 07-01-089, § 51-11-0101, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27A.020, 19.27A.045. 04-01-106, § 51-11-0101, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27A.025, 19.27A.045. 01-03-010, § 51-11-0101, filed 1/5/01, effective 7/1/01. Statutory Authority: RCW 19.27.031 and 19.27.074. 98-24-078, § 51-11-0101, filed 12/1/98, effective 7/1/99. Statutory Authority: RCW 19.27A.025 and 19.27A.045. 98-03-003, § 51-11-0101, filed 1/8/98, effective 7/1/98. Statutory Authority: RCW 19.27A.025. 93-21-052, § 51-11-0101, filed 10/18/93, effective 4/1/94. Statutory Authority: RCW 19.27A.020 and 1990 c 2. 91-01-112, § 51-11-0101, filed 12/19/90, effective 7/1/91.]

Reviser's note: Notice of Objection: The Joint Administrative Rules Review Committee (Committee) finds that, in adopting the 2009 proposed changes to the State Energy Code, Chapter 51-11 WAC, on November 20, 2009, the State Building Code Council (Council) failed to comply with all requirements of the law and failed to adequately respond to the Committee's request for additional economic impact and cost-benefit analyses prior to adoption.

On October 1, 2009, the Committee found that the Small Business Economic Impact Statement (SBEIS) for the proposed changes filed with the Code Reviser failed to comply with all requirements of law. The Committee requested that the Council conduct a cost-benefit analysis pursuant to RCW 34.05.328 and amend the SBEIS to provide additional economic impact information, including an estimate of the number of jobs that would be created or lost as a result of compliance with all the proposed rules, as required by RCW 19.85.040 (2)(d).

The Council provided the Committee with information and data on November 18, 2009. On December 2, 2009, the Committee found that the Council failed to adequately respond to the Committee's request for additional data. Specifically, the Committee found that the Council failed to amend the SBEIS to (a) estimate the number of jobs that would be created or lost as a result of compliance with the proposed changes; and (b) support the SBEIS with a detailed and rigorous costs analysis of the cumulative impact of all the changes. In addition, the Committee found that the Council failed to provide the Committee with a cost-benefit analysis of the proposed changes and pursuant to the requirements of RCW 34.05.328.

The Committee strongly supports a process that makes thoughtful and informed progress towards changes that result in improved energy efficiency in our buildings, wherever practicable. While the Council worked diligently, it is the opinion of the Committee that the Council did not fully develop and consider the economic impacts and costs versus benefits of these significant changes to our Energy Code. Furthermore, it is the opinion of the Committee that the Council and the Legislature need this information to fully evaluate the value, impacts, and consequences of the proposed codes, with due diligence to their respective fiduciary responsibilities, in order to create the best informed public policy.

As a result, the Committee recommends that the Governor suspend the adoption and implementation of the changes to the Energy Code, Chapter 51-11 WAC, adopted by the Council on November 20, 2009, until such time as a more adequate analysis has been completed and considered by the appropriate bodies.

For all of the above stated reasons, the Committee objects to the changes to the State Energy Code, Chapter 51-11 WAC, that were adopted by the Council on November 20, 2009, and hereby directs the Code Reviser, pursuant to RCW 34.05.640(4), to publish this Notice of Objection in the Washington State Register and along with any publication in the Washington Administrative Code of changes to Chapter 51-11 WAC that were adopted by the Council in 2009 and filed with the Code Reviser.

WAC 51-11-0105 Inspections and enforcement.

105.1 General: All construction or work for which a permit is required shall be subject to inspection by the building official and all such construction or work shall remain accessible and exposed for inspection purposes until approved by the building official.

105.2 Approvals Required: No work shall be done on any part of the building or structure beyond the point indicated in each successive inspection without first obtaining the approval of the building official.

105.2.1 Required Inspections: The building official, upon notification, shall make the following inspection in addition to those inspections required in section 109.3 of the International Building Code:

1. Wall insulation inspection: To be made after all wall insulation and air vapor retarder sheet or film materials are in place, but before any wall covering is placed.

105.3 Reinspection: The building official may require a structure to be reinspected.

105.4 Certificate: A permanent certificate shall be posted within three feet of the electrical distribution panel. The certificate shall be completed by the builder or registered design professional. The certificate shall list the predominant R-values of insulation installed in or on ceiling/roof, walls, foundation (slab, basement wall, crawlspace wall and/or floor), and ducts outside the conditioned spaces; U-factors for fenestration; and the solar heat gain coefficient (SHGC) of fenestration. Where there is more than one value for each component, the certificate shall list the value covering the

largest area. The certificate shall list the type and efficiency of heating, cooling, and service water heating equipment, duct leakage rates including test conditions as specified in Section 503.10.2, and air leakage results if a blower door test was conducted.

[Statutory Authority: RCW 19.27A.025, 19.27A.045. 10-03-115, 10-13-113 and 10-22-056, § 51-11-0105, filed 1/20/10, 6/21/10 and 10/28/10, effective 1/1/11. Statutory Authority: RCW 19.27A.020, 19.27A.045. 04-01-106, § 51-11-0105, filed 12/17/03, effective 7/1/04. Statutory Authority: Chapters 19.27 and 19.27A RCW and 1994 c 226. 95-01-126, § 51-11-0105, filed 12/21/94, effective 6/30/95. Statutory Authority: RCW 19.27A.020 and 1990 c 2. 91-01-112, § 51-11-0105, filed 12/19/90, effective 7/1/91.]

Reviser's note: Notice of Objection: The Joint Administrative Rules Review Committee (Committee) finds that, in adopting the 2009 proposed changes to the State Energy Code, Chapter 51-11 WAC, on November 20, 2009, the State Building Code Council (Council) failed to comply with all requirements of the law and failed to adequately respond to the Committee's request for additional economic impact and cost-benefit analyses prior to adoption.

On October 1, 2009, the Committee found that the Small Business Economic Impact Statement (SBEIS) for the proposed changes filed with the Code Reviser failed to comply with all requirements of law. The Committee requested that the Council conduct a cost-benefit analysis pursuant to RCW 34.05.328 and amend the SBEIS to provide additional economic impact information, including an estimate of the number of jobs that would be created or lost as a result of compliance with all the proposed rules, as required by RCW 19.85.040 (2)(d).

The Council provided the Committee with information and data on November 18, 2009. On December 2, 2009, the Committee found that the Council failed to adequately respond to the Committee's request for additional data. Specifically, the Committee found that the Council failed to amend the SBEIS to (a) estimate the number of jobs that would be created or lost as a result of compliance with the proposed changes; and (b) support the SBEIS with a detailed and rigorous costs analysis of the cumulative impact of all the changes. In addition, the Committee found that the Council failed to provide the Committee with a cost-benefit analysis of the proposed changes and pursuant to the requirements of RCW 34.05.328.

The Committee strongly supports a process that makes thoughtful and informed progress towards changes that result in improved energy efficiency in our buildings, wherever practicable. While the Council worked diligently, it is the opinion of the Committee that the Council did not fully develop and consider the economic impacts and costs versus benefits of these significant changes to our Energy Code. Furthermore, it is the opinion of the Committee that the Council and the Legislature need this information to fully evaluate the value, impacts, and consequences of the proposed codes, with due diligence to their respective fiduciary responsibilities, in order to create the best informed public policy.

As a result, the Committee recommends that the Governor suspend the adoption and implementation of the changes to the Energy Code, Chapter 51-11 WAC, adopted by the Council on November 20, 2009, until such time as a more adequate analysis has been completed and considered by the appropriate bodies.

For all of the above stated reasons, the Committee objects to the changes to the State Energy Code, Chapter 51-11 WAC, that were adopted by the Council on November 20, 2009, and hereby directs the Code Reviser, pursuant to RCW 34.05.640(4), to publish this Notice of Objection in the Washington State Register and along with any publication in the Washington Administrative Code of changes to Chapter 51-11 WAC that were adopted by the Council in 2009 and filed with the Code Reviser.

WAC 51-11-0201 Scope. The following definitions shall apply to chapters 1 through 20.

201.1 Application of Terms: For the purposes of this Code, certain abbreviations, terms, phrases, words and their derivatives, shall be as set forth in this chapter. Where terms are not defined, they shall have their ordinary accepted meanings within the context with which they are used. In the event there is a question about the definition of a term, the definitions for terms in the codes enumerated in RCW 19.27.031 and the edition of Webster's dictionary referenced therein shall be considered as the sources for providing ordinarily accepted meanings.

Addition: See the Washington State Building Code.

Advanced framed ceiling: Advanced framing assumes full and even depth of insulation extending to the outside edge of exterior walls. (See Standard Framing and Section 1007.2 of this Code.)

Advanced framed walls: Studs framed on twenty-four inch centers with double top plate and single bottom plate. Corners use two studs or other means of fully insulating corners, and one stud is used to support each header. Headers consist of double 2X material with R-10 insulation between the header and exterior sheathing. Interior partition wall/exterior wall intersections are fully insulated in the exterior wall. (See Standard Framing and Section 1005.2 of this Code.)

AFUE. Annual fuel utilization efficiency: Unlike steady state conditions, this rating is based on average usage including on and off cycling as set out in the standardized Department of Energy Test Procedures.

Air barrier: Material(s) assembled and joined together to provide a barrier to air leakage through the building envelope. An air barrier may be a single material or a combination of materials.

Air conditioning, comfort: The process of treating air to control simultaneously its temperature, humidity, cleanliness and distribution to meet requirements of the conditioned space.

Air-impermeable insulation: An insulation having an air permeance equal to or less than 0.02 L/s-m^2 at 75 Pa pressure differential tested in accordance with ASTM E2178 or ASTM E283.

AHRI: Air-Conditioning, Heating and Refrigeration Institute.

Approved: Approval by the Code official as a result of investigation and tests conducted by him or her, or by reason of accepted principles, or tests by nationally recognized organizations.

ASHRAE: American Society of Heating, Refrigerating and Air Conditioning Engineers, Inc.

ASTM: American Society for Testing and Materials

Automatic: Self-acting, operating by its own mechanism when actuated by some impersonal influence, as for example, a change in current strength, pressure, temperature or mechanical configuration. (See **Manual.**)

Below grade walls: (See **Walls.**)

Boiler capacity: The rate of heat output in Btu/h measured at the boiler outlet, at the design inlet and outlet conditions and rated fuel/energy input.

Building entrance: Any doorway, set of doors, turnstile, vestibule, or other form of portal that is ordinarily used to gain access to the building by its users and occupants.

Building envelope: For single-family residential spaces, the elements of a building which enclose conditioned spaces through which thermal energy may be transferred to or from the exterior or to or from spaces exempted by the provisions of Section 101.3.1. For other spaces, the elements of a building which enclose conditioned spaces through which thermal energy may be transferred to or from the exterior, or to or from unconditioned spaces, or to or from semi-heated

spaces, or to or from spaces exempted by the provisions of Section 1301.

Building, existing: See the Washington State Building Code.

Building official: The official authorized to act in behalf of a jurisdiction code enforcement agency or its authorized representative.

Building project: A building or group of buildings, including on-site energy conversion or electric-generating facilities, which utilize a single submittal for a construction permit or are within the boundary of a contiguous area under one ownership.

Cold storage space: Spaces that are mechanically cooled and designed to be maintained at a temperature below 45°F (7°C) and at or above 28°F (-2.2°C).

Commissioning: A systematic process of verification and documentation that ensures that the selected building systems have been designed, installed and function properly, efficiently, and can be maintained in accordance with the contract documents in order to satisfy the building owner's design intent and operational requirements.

Conditioned floor area: (See Gross conditioned floor area.)

Conditioned space: A cooled space, heated space (fully heated), heated space (semi-heated) or indirectly conditioned space, excluding cold storage spaces and frozen storage spaces.

Continuous insulation (c.i.): Insulation that is continuous across all structural members without thermal bridges other than fasteners and service openings. It is installed on the interior or exterior or is integral to any opaque surface of the building envelope.

Cooled space: An enclosed space within a building that is cooled by a cooling system whose sensible capacity

a. Exceeds 5 Btu/(h•ft^2), or

b. Is capable of maintaining space dry bulb temperature of 90°F or less at design cooling conditions.

COP - Coefficient of performance: The ratio of the rate of net heat output (heating mode) or heat removal (cooling mode) to the rate of total on-site energy input to the heat pump, expressed in consistent units and under designated rating conditions. (See Net Heat Output, Net Heat Removal, Total On-Site Energy Input.)

Daylighted zone:

a. Under overhead glazing: The area under overhead glazing whose horizontal dimension, in each direction, is equal to the overhead glazing dimension in that direction plus either 70 percent of the floor to ceiling height or the dimension to a ceiling height opaque partition, or one-half the distance to adjacent overhead or vertical glazing, whichever is least.

b. At vertical glazing: The area adjacent to vertical glazing which receives daylighting from the glazing. For purposes of this definition and unless more detailed daylighting analysis is provided, the primary daylighted zone depth extends into the space a distance equal to the window head height and the secondary daylighted zone extends from the edge of the primary zone to a distance equal to two times the window head height, or to the nearest ceiling height opaque partition, whichever is less. The daylighting zone width is assumed to be the width of the window plus either two feet on each side (the distance to an opaque partition) or one-half the distance to adjacent overhead or vertical glazing, whichever is least.

Daylight sensing control (DS): A device that automatically regulates the power input to electric lighting near the glazing to maintain the desired workplace illumination, thus taking advantage of direct or indirect sunlight.

Deadband: The temperature range in which no heating or cooling is used.

Demand control ventilation (DCV): A ventilation system capability that provides for the automatic reduction of outdoor air intake below design rates when the actual occupancy of spaces served by the system is less than design occupancy.

Design cooling conditions: The temperatures specified in Section 302.

Design heating conditions: The temperatures specified in Section 302.

Domestic water system: Supply of hot water and cold water for domestic or commercial purposes other than comfort heating and cooling.

Door: All operable opening areas, which are not glazing, in the building envelope including swinging and roll-up doors, fire doors, smoke vents and access hatches.

Door area: Total area of door measured using the rough opening and including the door and frame.

Dwelling unit: See the Washington State Building Code.

Economizer, air: A ducting arrangement and automatic control system that allows a cooling supply fan system to supply outside air to reduce or eliminate the need for mechanical refrigeration during mild or cold weather.

Economizer, water: A system by which the supply air of a cooling system is cooled directly, indirectly or both, by evaporation of water or by other appropriate fluid in order to reduce or eliminate the need for mechanical refrigeration.

EER. Energy efficiency ratio: The ratio of net equipment cooling capacity in Btu/h to total rate of electric input in watts under designated operating conditions.

Efficiency, HVAC system: The ratio of useful energy (at the point of use) to the energy input for a designated time period, expressed in percent.

Emissivity: The ability to absorb infrared radiation. A low emissivity implies a higher reflectance of infrared radiation.

Energy: The capacity for doing work; taking a number of forms which may be transformed from one into another, such as thermal (heat), mechanical (work), electrical and chemical; in customary units, measured in kilowatt-hours (kWh) or British thermal units (Btu). (See **New energy.**)

Energy, recovered: (See **Recovered energy.**)

Energy recovery ventilation system: System that employs air-to-air heat exchangers to recover energy from exhaust air for the purpose of preheating, precooling, humidifying or dehumidifying outdoor ventilation air prior to supplying the air to a space, either directly or as part of an HVAC system.

Exterior envelope: (See **Building envelope.**)

F-Factor: The perimeter heat loss factor expressed in Btu/hr•ft•°F.

F-Value: (See F-Factor.)

Facade area: Vertical projected area including nonhorizontal roof area, overhangs, cornices, etc. measured in elevation in a vertical plane parallel to the plane of the building face.

Fenestration: All areas (including the frames) in the building envelope that let in light, including windows, plastic panels, clerestories, skylights, doors that are more than one-half glass, and glass block walls. (See building envelope and door.)

a. **Skylight:** A fenestration surface having a slope of less than 60 degrees from the horizontal plane. Other fenestration, even if mounted on the roof of a building, is considered vertical fenestration.

b. **Vertical fenestration:** All fenestration other than skylights. Trombe wall assemblies, where glazing is installed within 12 inches of a mass wall, are considered walls, not fenestration. For the purposes of determining building envelope requirements, the vertical fenestration classifications are defined as follows:

i. **Metal framing:** Products with metal framing with or without thermal break.

ii. **Metal framing, entrance door:** Any doorway, set of doors, turnstile, vestibule, or other form of portal that is ordinarily used to gain access by its users and occupants to the building or to individual tenant spaces accessed from the exterior. (See also building entrance.)

iii. **Metal framing, fixed:** All vertical fenestration, other than entrance door and operable, including, but not limited to, curtain walls, window walls, fixed windows, picture windows, glass block walls, nonopenable clerestory windows, and nonopenable sidelites and transoms.

iv. **Metal framing, operable:** All vertical fenestration that opens, except entrance doors, including, but not limited to, casement windows, projecting windows, pivoting windows, horizontal sliding windows, vertical sliding windows, openable clerestory windows, openable sidelites and transoms, sliding glass doors, and doors that are not entrance doors.

v. **Nonmetal framing:** All products with framing materials other than metal with or without metal reinforcing or cladding.

Floor, envelope: That lower portion of the building envelope, including opaque area and fenestration, that has conditioned or semiheated space above and is horizontal or tilted at an angle of less than 60 degrees from horizontal but excluding slab-on-grade floors. For the purposes of determining building envelope requirements, the classifications are defined as follows:

a. **Mass floor:** A floor with a heat capacity that exceeds 7 Btu/ft^2•°F or 5 Btu/ft^2•°F provided that the floor has a material unit mass not greater than 120 lb/ft^3.

b. **Steel-joist floor:** A floor that is not a mass floor and has steel joist members supported by structural members.

c. **Wood-framed and other floors:** All other floor types, including wood joist floors. (See also building envelope, fenestration, opaque area and slab-on-grade floor.)

Floor over unconditioned space: A floor which separates a conditioned space from an unconditioned space which is buffered from exterior ambient conditions including vented crawl spaces and unconditioned basements or other similar spaces, or exposed to exterior ambient conditions including open parking garages and enclosed garages which are mechanically ventilated.

Frozen storage space: Spaces that are mechanically cooled and designed to be maintained at a temperature below 28°F (-2.2°C).

Garden window: A multisided glazing product that projects beyond the plane of the wall.

Glazed wall system: A category of site assembled fenestration products used in the NFRC 100 and NFRC 200 rating procedures that include curtainwalls.

Glazing: All areas, including the frames, in the shell of a conditioned space that let in natural light including windows, clerestories, skylights, sliding or swinging glass doors and glass block walls.

Glazing area: Total area of the glazing measured using the rough opening, and including the glazing, sash, and frame. For doors where the daylight opening area is less than 50% of the door area, the glazing area is the daylight opening area. For all other doors, the glazing area is the door area.

Gross conditioned floor area: The horizontal projection of that portion of interior space which is contained within exterior walls and which is conditioned directly or indirectly by an energy-using system, and which has an average height of five feet or greater, measured from the exterior faces.

Gross exterior wall area: The normal projection of the building envelope wall area bounding interior space which is conditioned by an energy-using system and which separates conditioned space from: Unconditioned space, or semiheated space, or exterior ambient conditions or earth; includes opaque wall, vertical glazing and door areas. The gross area of walls consists of all opaque wall areas, including foundation walls, between floor spandrels, peripheral edges of floors, vertical glazing areas and door areas, where such surfaces are exposed to exterior ambient conditions and enclose a conditioned space including interstitial areas between two such spaces. The area of the wall is measured from the top of the floor insulation to the bottom of the roof insulation. (See Below grade wall.)

Gross floor area: The sum of the areas of the several floors of the building, including basements, cellars, mezzanine and intermediate floored tiers and penthouses of headroom height, measured from the exterior faces of exterior walls or from the center line of walls separating buildings, but excluding: Covered walkways, open roofed-over areas, porches and similar spaces. Pipe trenches, exterior terraces or steps, chimneys, roof overhangs and similar features.

Gross roof/ceiling area: A roof/ceiling assembly shall be considered as all components of the roof/ceiling envelope through which heat flows, thus creating a building transmission heat loss or gain, where such assembly is exposed to exterior ambient conditions and encloses a conditioned space. The assembly does not include those components that are separated from a heated and/or cooled space by a vented airspace. The gross area of a roof/ceiling assembly consists of the total interior surface of such assembly, including overhead glazing.

Guest room: See the Washington State Building Code.

Heat: The form of energy that is transferred by virtue of a temperature difference.

Heat storage capacity: The physical property of materials (mass) located inside the building envelope to absorb, store, and release heat.

Heated space (Fully heated): An enclosed space within a building, including adjacent connected spaces separated by an uninsulated component (e.g., basements, utility rooms, garages, corridors), which is heated by a heating system whose output capacity is

a. Capable of maintaining a space dry-bulb temperature of 45°F or greater at design heating conditions; or

b. 8 Btu/(h•ft^2) or greater in Climate Zone 1 and 12 Btu/(h•ft^2) or greater in Climate Zone 2.

Heated space (Semi-heated): An enclosed space within a building, including adjacent connected spaces separated by an uninsulated component (e.g., basements, utility rooms, garages, corridors), which is heated by a heating system

a. Whose output capacity is 3 Btu/(h•ft^2) or greater in Climate Zone 1 and 5 Btu/(h•ft^2) or greater in Climate Zone 2; and

b. Is not a Heated Space (Fully Heated).

c. Is not a cold storage space or frozen storage space.

High efficacy lamps: Compact fluorescent lamps, T-8 or smaller diameter linear fluorescent lamps, or lamps with a minimum efficacy of:

a. 60 lumens per watt for lamps over 40 watts;

b. 50 lumens per watt for lamps over 15 watts to 40 watts; and

c. 40 lumens per watt for lamps 15 watts or less.

High efficacy luminaire: A lighting fixture that does not contain a medium screw base socket (E24/E26) and whose lamps or other light source have a minimum efficiency of:

a. 60 lumens per watt for lamps over 40 watts;

b. 50 lumens per watt for lamps over 15 watts to 40 watts;

c. 40 lumens per watt for lamps 15 watts or less.

HSPF. Heating season performance factor: The total heating output (in Btu) of a heat pump during its normal annual usage period for heating divided by the total (watt hour) electric power input during the same period, as determined by test procedures consistent with the U.S. Department of Energy "Test Procedure for Central Air Conditioners, Including Heat Pumps" published in Standard RS-30. When specified in Btu per watt hour an HSPF of 6.826 is equivalent to a COP of 2.0.

Humidistat: A regulatory device, actuated by changes in humidity, used for automatic control of relative humidity.

HVAC: Heating, ventilating and air conditioning.

HVAC system components: HVAC system components provide, in one or more factory-assembled packages, means for chilling and/or heating water with controlled temperature for delivery to terminal units serving the conditioned spaces of the buildings. Types of HVAC system components include, but are not limited to, water chiller packages, reciprocating condensing units and water source (hydronic) heat pumps. (See **HVAC system equipment.**)

HVAC system efficiency: (See **Efficiency, HVAC system.**)

HVAC system equipment: HVAC system equipment provides, in one (single package) or more (split system) factory-assembled packages, means for air circulation, air cleaning, air cooling with controlled temperature and dehumidification; and optionally, either alone or in combination with a heating plant, the functions of heating and humidifying. The cooling function may be either electrically or heat operated and the refrigerant condenser may be air, water or evaporatively cooled. Where the equipment is provided in more than one package, the separate packages shall be designed by the manufacturer to be used together. The equipment may provide the heating function as a heat pump or by the use of electric elements. (The word "equipment" used without modifying adjective may, in accordance with common industry usage, apply either to HVAC system equipment or HVAC system components.)

Indirectly conditioned space: An enclosed space within a building that is not a heated or cooled space, whose area weighted heat transfer coefficient to heated or cooled spaces exceeds that to the outdoors or to unconditioned spaces; or through which air from heated or cooled spaces is transferred at a rate exceeding three air changes per hour. Enclosed corridors between conditioned spaces shall be considered as indirectly conditioned space. (See **Heated Space, Cooled Space** and **Unconditioned Space.**)

Infiltration: The uncontrolled inward air leakage through cracks and interstices in any building element and around windows and doors of a building caused by the pressure effects of wind and/or the effect of differences in the indoor and outdoor air density.

Insulation baffle: A rigid material, resistant to wind driven moisture, the purpose of which is to allow air to flow freely into the attic or crawl space and to prevent insulation from blocking the ventilation of these spaces, or the loss of insulation. Example materials for this purpose are sheet metal, or wax impregnated cardboard.

Insulation position:

a. **Exterior Insulation Position:** A wall having all or nearly all of its mass exposed to the room air with the insulation on the exterior of the mass.

b. **Integral Insulation Position:** A wall having mass exposed to both room and outside air, with substantially equal amounts of mass on the inside and outside of the insulation layer.

c. **Interior Insulation Position:** A wall not meeting either of the above definitions; particularly a wall having most of its mass external to the insulation layer.

International Building Code (IBC): (See Washington State Building Code.)

International Mechanical Code (IMC): (See Washington State Building Code.)

IPLV—Integrated part-load value: A single number figure of merit based on part-load EER or COP expressing part-load efficiency for air conditioning and heat pump equipment on the basis of weighted operation at various load capacities for the equipment as specified in the Air-Conditioning and Refrigeration Institute (AHRI) and Cooling Tower Institute (CTI) procedures.

Labeled: Devices, equipment, or materials to which have been affixed a label, seal, symbol or other identifying mark of a nationally recognized testing laboratory, inspection agency, or other organization concerned with product evaluation that maintains periodic inspection of the production of

the above-labeled items that attests to compliance with a specific standard.

Liner system (Ls): A continuous membrane is installed below the purlins and uninterrupted by framing members. Uncompressed, unfaced insulation rests on top of the membrane between the purlins. For multilayer installations, the last rated R-value of insulation is for unfaced insulation draped over purlins and then compressed when the metal roof panels are attached. A minimum R-3 (R-0.5) thermal spacer block between the purlins and the metal roof panels is required, unless compliance is shown by the overall assembly U-factor.

Listed: Equipment, appliances, assemblies, or materials included in a list published by an approved testing laboratory, inspection agency, or other organization concerned with product evaluation that maintains periodic inspection of production of listed equipment, appliances, assemblies, or material, and whose listing states either that the equipment, appliances, assemblies, or material meets nationally recognized standards or has been tested and found suitable for use in a specified manner.

Luminaire: A complete lighting unit consisting of a lamp or lamps together with the parts designed to distribute the light, to position and protect the lamps and to connect the lamps to the electric power supply.

Manual: Capable of being operated by personal intervention. (See **Automatic.)**

Mechanical system: Equipment and components that provide heating, cooling, and ventilation for any purpose other than domestic water systems.

Microcell: A wireless communication facility consisting of an antenna that is either: (a) Four (4) feet in height and with an area of not more than 580 square inches; or (b) if a tubular antenna, no more than four (4) inches in diameter and no more than six (6) feet in length; and the associated equipment cabinet that is six (6) feet or less in height and no more than 48 square feet in floor area.

NFPA: National Fire Protection Association.

NFRC: National Fenestration Rating Council.

Net heat output: The change in the total heat content of the air entering and leaving the equipment (not including supplementary heat and heat from boilers).

Net heat removal: The total difference in heat content of the air entering and leaving the equipment (without heat) or the difference in total heat content of the water or refrigerant entering and leaving the component.

New energy: Energy, other than recovered energy, utilized for the purpose of heating or cooling. (See **energy.**)

Nominal R-value: The thermal resistance of insulation alone as determined in accordance with the U.S. Federal Trade Commission R-value rule (CFR Title 16, Part 460) in units of h•ft²•°F/Btu at a mean temperature of 75°F. Nominal R-value refers to the thermal resistance of the added insulation in framing cavities or insulated sheathing only and does not include the thermal resistance of other building materials or air films.

Nonrenewable energy sources: All energy sources that are not renewable energy sources including natural gas, oil, coal, wood, liquefied petroleum gas, steam, and any utility-supplied electricity.

Nonresidential: All spaces as defined in this Code other than residential.

Occupancy: See the Washington State Building Code.

Occupancy sensor: A device that detects occupants within an area, causing any combination of lighting, equipment or appliances to be turned on or shut off.

On-site renewable energy power system: Photovoltaic, solar thermal, geothermal, and wind systems used to generate electrical power and located on the building site.

Opaque envelope areas: All exposed areas of a building envelope which enclose conditioned space, except openings for doors, glazing and building service systems.

Open blown: Loose fill insulation pneumatically installed in an unconfined attic space.

Outdoor air (outside air): Air taken from the outdoors and, therefore, not previously circulated through a building.

Overhead glazing: A glazing surface that has a slope of less than 60° from the horizontal plane.

Packaged terminal air conditioner: A factory-selected combination of heating and cooling components, assemblies or sections intended to serve a room or zone. (For the complete technical definition, see Standard RS-5.)

Permeance (perm): The ability of a material of specified thickness to transmit moisture in terms of amount of moisture transmitted per unit time for a specified area and differential pressure (grains per hour • ft² • inches of HG). Permeance may be measured using ASTM E-96-00 or other approved dry cup method as specified in RS-1.

Personal wireless service facility: A Wireless Communication Facility (WCF), including a microcell, which is a facility for the transmission and/or reception of radio frequency signals and which may include antennas, equipment shelter or cabinet, transmission cables, a support structure to achieve the necessary elevation, and reception and/or transmission devices or antennas.

Pool cover: A vapor-retardant cover which lies on or at the surface of the pool.

Power: In connection with machines, the time rate of doing work. In connection with the transmission of energy of all types, the rate at which energy is transmitted; in customary units, it is measured in watts (W) or British Thermal Units per hour (Btu/h).

Process energy: Energy consumed in support of a manufacturing, industrial, or commercial process other than the maintenance of building comfort or amenities for building occupants.

Radiant slab floor: A slab floor assembly on grade or below, containing heated pipes, ducts, or electric heating cables that constitute a floor or portion thereof for complete or partial heating of the structure.

Readily accessible: See the Washington State Mechanical Code.

Recooling: The removal of heat by sensible cooling of the supply air (directly or indirectly) that has been previously heated above the temperature to which the air is to be supplied to the conditioned space for proper control of the temperature of that space.

Recovered energy: Energy utilized which would otherwise be wasted (i.e., not contribute to a desired end use) from an energy utilization system.

Refrigerated warehouse: A building that contains cold storage spaces or frozen storage spaces that have a total area exceeding 3,000 square feet.

Reheat: The application of sensible heat to supply air that has been previously cooled below the temperature of the conditioned space by either mechanical refrigeration or the introduction of outdoor air to provide cooling.

Renewable energy sources: Renewable energy sources of energy (excluding minerals) are derived from: (1) Incoming solar radiation, including but not limited to, natural daylighting and photosynthetic processes; (2) energy sources resulting from wind, waves and tides, lake or pond thermal differences; and (3) energy derived from the internal heat of the earth, including nocturnal thermal exchanges.

Reset: Adjustment of the set point of a control instrument to a higher or lower value automatically or manually to conserve energy.

Residential: The following two categories comprise all residential spaces for the purposes of this Code:

a. **Single-family:** All spaces within the scope of Section R101.2 of the International Residential Code.

b. **Multifamily:**

i. All Group R Occupancy not falling under the scope of Section 101.2 of the International Residential Code including, but not limited to, dwelling units, hotel/motel guest rooms, dormitories, fraternity/sorority houses, hostels, prisons, and fire stations;

ii. All sleeping areas in Group I Occupancy including, but not limited to, assisted living facilities, nursing homes, patient rooms in hospitals, prisons, and fire stations; and

iii. All sleeping areas in other occupancies including, but not limited to, fire stations.

Roof: The upper portion of the building envelope, including opaque areas and fenestration, that is horizontal or tilted at an angle of less than 60 degrees from horizontal. For the purposes of determining building envelope requirements, the classifications are defined as follows:

a. **Attic and other roofs:** All other roofs, including roofs with insulation entirely below (inside of) the roof structure (i.e., attics, cathedral ceilings, and single-rafter ceilings), roofs with insulation both above and below the roof structure, and roofs without insulation but excluding metal building roofs.

b. **Metal building roof:** A roof that is:

i. Constructed with a metal, structural, weathering surface;

ii. Has no ventilated cavity; and

iii. Has the insulation entirely below deck (i.e., does not include composite concrete and metal deck construction nor a roof framing system that is separated from the superstructure by a wood substrate) and whose structure consists of one or more of the following configurations:

A. Metal roofing in direct contact with the steel framing members;

B. Insulation between the metal roofing and the steel framing members;

C. Insulated metal roofing panels installed as described in 1 or 2.

Roof with insulation entirely above deck: A roof with all insulation installed above (outside of) the roof structure and continuous (i.e., uninterrupted by framing members).

Roof/ceiling assembly: (See Gross roof/ceiling area.)

SEER - Seasonal Energy Efficiency Ratio: The total cooling output of an air conditioner during its normal annual usage period, in Btu's, divided by the total electric energy input in watt-hours, during the same period, as determined by 10 CFR, Part 430.

Semi-heated space: Sub-category of **Heated Space.** (See **Heated Space.**)

Sequence: A consecutive series of operations.

Service systems: All energy-using systems in a building that are operated to provide services for the occupants or processes housed therein, including HVAC, service water heating, illumination, transportation, cooking or food preparation, laundering or similar functions.

Service water heating: Supply of hot water for domestic or commercial purposes other than comfort heating.

Shaded: Glazed area which is externally protected from direct solar radiation by use of devices permanently affixed to the structure or by an adjacent building, topographical feature, or vegetation.

Shading coefficient: The ratio of solar heat gain occurring through nonopaque portions of the glazing, with or without integral shading devices, to the solar heat gain occurring through an equivalent area of unshaded, 1/8 inch thick, clear, double-strength glass.

Note: Heat gains to be compared under the same conditions. See Chapter 15 of Standard RS-1, listed in Chapter 7 of this Code.

Shall: Denotes a mandatory code requirement.

Single family: (See **Residential.**)

Skylight: (See **Fenestration.**)

Slab-below-grade: Any portion of a slab floor in contact with the ground which is more than 24 inches below the final elevation of the nearest exterior grade.

Slab-on-grade, exterior: Any portion of a slab floor in contact with the ground which is less than or equal to twenty-four inches below the final elevation of the nearest exterior grade.

Small business: Any business entity (including a sole proprietorship, corporation, partnership, or other legal entity) which is owned and operated independently from all other businesses, which has the purpose of making a profit, and which has fifty or fewer employees, or which has a million dollars or less per year in gross sales, of window products.

Solar energy source: Source of natural daylighting and of thermal, chemical or electrical energy derived directly from conversion of incident solar radiation.

Solar heat gain coefficient (SHGC): The ratio of the solar heat gain entering the space through the glazing product to the incident solar radiation. Solar heat gain includes directly transmitted solar heat and absorbed solar radiation which is then reradiated, conducted or convected into the space.

Split system: Any heat pump or air conditioning unit which is provided in more than one assembly requiring refrigeration piping installed in the field.

Standard framing: All framing practices not defined as "intermediate" or "advanced" shall be considered standard. (See Advanced framed ceiling, Advanced framed walls, Intermediate framed wall and Section 1005.2 of this Code.)

Substantial contact: A condition where adjacent building materials are placed in a manner that proximal surfaces are contiguous, being installed and supported as to eliminate voids between materials, without compressing or degrading the thermal performance of either product.

System: A combination of central or terminal equipment or components and/or controls, accessories, interconnecting means, and terminal devices by which energy is transformed so as to perform a specific function, such as HVAC, service water heating or illumination.

Tapering: Installation of a reduced level of ceiling insulation at the eaves, due to reduced clearance.

Thermal by-pass: An area where the envelope surrounding the conditioned space is breached, or where an ineffective application compromises the performance of a thermal or infiltration barrier, increasing the structure's energy consumption by exposing finished surfaces to ambient conditions and additional heat transfer.

Thermal conductance (C): Time rate of heat flow through a body (frequently per unit area) from one of its bounding surfaces to the other for a unit temperature difference between the two surfaces, under steady conditions (Btu/hr•ft²•°F).

Thermal resistance (R): The reciprocal of thermal conductance (hr•ft²•°F/Btu).

Thermal transmittance (U): The coefficient of heat transmission (air to air). It is the time rate of heat flow per unit area and unit temperature difference between the warm side and cold side air films (Btu/hr•ft²•°F).

Thermal transmittance, overall (U_o): The overall (average) heat transmission of a gross area of the exterior building envelope (Btu/hr•ft²•°F). The U_o-factor applies to the combined effect of the time rate of heat flows through the various parallel paths, such as glazing, doors and opaque construction areas, comprising the gross area of one or more exterior building components, such as walls, floors or roof/ceiling.

Thermostat: An automatic control device actuated by temperature and designed to be responsive to temperature.

Total on-site energy input: The combination of all the energy inputs to all elements and accessories as included in the equipment components, including but not limited to, compressor(s), compressor sump heater(s), circulating pump(s), purge devices, fan(s), and the HVAC system component control circuit.

Transmission coefficient: The ratio of the solar heat gain through a glazing system to that of an unshaded single pane of double strength window glass under the same set of conditions.

Transverse joint: The primary connection between air distribution system fittings.

U-factor: (See thermal transmittance.)

U-Value: (See U-factor.)

Uniform Plumbing Code (UPC): (See Washington State Plumbing Code.)

Unitary cooling and heating equipment: One or more factory-made assemblies which include an evaporator or cooling coil, a compressor and condenser combination, and may include a heating function as well. Where such equipment is provided in more than one assembly, the separate assemblies shall be designed to be used together.

Unitary heat pump: One or more factory-made assemblies which include an indoor conditioning coil, compressor(s) and outdoor coil or refrigerant-to-water heat exchanger, including means to provide both heating and cooling functions. When such equipment is provided in more than one assembly, the separate assemblies shall be designed to be used together.

Vapor retarder: A layer of low moisture transmissivity material (not more than 1.0 perm dry cup) placed over the warm side (in winter) of insulation, over the exterior of below grade walls, and under floors as ground cover to limit the transport of water and water vapor through exterior walls, ceilings, and floors. Vapor retarding paint, listed for this application, also meets this definition.

Vaulted ceilings: All ceilings where enclosed joist or rafter space is formed by ceilings applied directly to the underside of roof joists or rafters.

Ventilation: The process of supplying or removing air by natural or mechanical means to or from any space. Such air may or may not have been conditioned.

Ventilation air: That portion of supply air which comes from outside (outdoors) plus any recirculated air that has been treated to maintain the desired quality of air within a designated space.

Vertical glazing: A glazing surface that has a slope of 60° or greater from the horizontal plane.

Wall: That portion of the building envelope, including opaque area and fenestration, that is vertical or tilted at an angle of 60 degrees from horizontal or greater. This includes above- and below-grade walls, between floor spandrels, peripheral edges of floors, and foundation walls. For the purposes of determining building envelope requirements, the classifications are defined as follows:

a. **Above-grade wall:** A wall that is not a below-grade wall.

b. **Below-grade wall:** That portion of a wall in the building envelope that is entirely below the finish grade and in contact with the ground.

c. **Mass wall:** A wall with a heat capacity exceeding 7 Btu/ft²•°F or 5 Btu/ft²•°F, provided that the wall has a material unit weight not greater than 120 lb/ft³.

d. **Metal building wall:** A wall whose structure consists of metal spanning members supported by steel structural members (i.e., does not include spandrel glass or metal panels in curtain wall systems).

e. **Steel-framed wall:** A wall with a cavity (insulated or otherwise) whose exterior surfaces are separated by steel framing members (i.e., typical steel stud walls and curtain wall systems).

f. **Wood-framed and other walls:** All other wall types, including wood stud walls.

Walls (exterior): Any member or group of members which defines the exterior boundaries or courts of a building and which have a slope of sixty degrees or greater with the horizontal plane, and separates conditioned from unconditioned space. Band joists between floors are to be considered a part of exterior walls.

Washington State Building Code: The Washington State Building Code is comprised of the International Building Code; the International Residential Code; the International Mechanical Code; the International Fire Code; the Uniform Plumbing Code; the state regulations for barrier-free facilities, as designated in RCW 19.27.031; the State Energy Code; and any other codes so designated by the Washington state legislature as adopted and amended by the State Building Code Council.

Zone: A space or group of spaces within a building with heating and/or cooling requirements sufficiently similar so that comfort conditions can be maintained throughout by a single controlling device. Each dwelling unit in residential buildings shall be considered a single zone.

[Statutory Authority: RCW 19.27A.025, 19.27A.045. 10-03-115, 10-13-113 and 10-22-056, § 51-11-0201, filed 1/20/10, 6/21/10 and 10/28/10, effective 1/1/11. Statutory Authority: RCW 19.27A.022, 19.27A.025, 19.27A.045, and chapters 19.27 and 34.05 RCW. 07-01-089, § 51-11-0201, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27A.020, 19.27A.045. 04-01-106, § 51-11-0201, filed 12/17/03, effective 7/1/04; 02-24-076, § 51-11-0201, filed 12/4/02, effective 5/1/03. Statutory Authority: RCW 19.27A.025, 19.27A.045. 01-03-010, § 51-11-0201, filed 1/5/01, effective 7/1/01; 98-03-003, § 51-11-0201, filed 1/8/98, effective 7/1/98. Statutory Authority: Chapters 19.27, 19.27A and 34.05 RCW. 94-05-059, § 51-11-0201, filed 2/10/94, effective 4/1/94. Statutory Authority: RCW 19.27A.025. 93-21-052, § 51-11-0201, filed 10/18/93, effective 4/1/94. Statutory Authority: RCW 19.27A.020 and 1990 c 2. 91-01-112, § 51-11-0201, filed 12/19/90, effective 7/1/91.]

Reviser's note: Notice of Objection: The Joint Administrative Rules Review Committee (Committee) finds that, in adopting the 2009 proposed changes to the State Energy Code, Chapter 51-11 WAC, on November 20, 2009, the State Building Code Council (Council) failed to comply with all requirements of the law and failed to adequately respond to the Committee's request for additional economic impact and cost-benefit analyses prior to adoption.

On October 1, 2009, the Committee found that the Small Business Economic Impact Statement (SBEIS) for the proposed changes filed with the Code Reviser failed to comply with all requirements of law. The Committee requested that the Council conduct a cost-benefit analysis pursuant to RCW 34.05.328 and amend the SBEIS to provide additional economic impact information, including an estimate of the number of jobs that would be created or lost as a result of compliance with all the proposed rules, as required by RCW 19.85.040 (2)(d).

The Council provided the Committee with information and data on November 18, 2009. On December 2, 2009, the Committee found that the Council failed to adequately respond to the Committee's request for additional data. Specifically, the Committee found that the Council failed to amend the SBEIS to (a) estimate the number of jobs that would be created or lost as a result of compliance with the proposed changes; and (b) support the SBEIS with a detailed and rigorous costs analysis of the cumulative impact of all the changes. In addition, the Committee found that the Council failed to provide the Committee with a cost-benefit analysis of the proposed changes and pursuant to the requirements of RCW 34.05.328.

The Committee strongly supports a process that makes thoughtful and informed progress towards changes that result in improved energy efficiency in our buildings, wherever practicable. While the Council worked diligently, it is the opinion of the Committee that the Council did not fully develop and consider the economic impacts and costs versus benefits of these significant changes to our Energy Code. Furthermore, it is the opinion of the Committee that the Council and the Legislature need this information to fully evaluate the value, impacts, and consequences of the proposed codes, with due diligence to their respective fiduciary responsibilities, in order to create the best informed public policy.

As a result, the Committee recommends that the Governor suspend the adoption and implementation of the changes to the Energy Code, Chapter 51-11 WAC, adopted by the Council on November 20, 2009, until such time as a more adequate analysis has been completed and considered by the appropriate bodies.

For all of the above stated reasons, the Committee objects to the changes to the State Energy Code, Chapter 51-11 WAC, that were adopted by the Council on November 20, 2009, and hereby directs the Code Reviser, pursuant to RCW 34.05.640(4), to publish this Notice of Objection in the Washington State Register and along with any publication in the Washington Administrative Code of changes to Chapter 51-11 WAC that were adopted by the Council in 2009 and filed with the Code Reviser.

WAC 51-11-0302 Thermal design parameters.

302.1 Exterior Design Conditions: The heating or cooling outdoor design temperatures shall be selected from Table 3-1.

302.2 Interior Design Conditions:

302.2.1 Indoor Design Temperature: Indoor design temperature shall be seventy degrees F for heating and seventy-eight degrees F for cooling.

EXCEPTION: Other design temperatures may be used for equipment selection if it results in a lower energy usage.

302.2.2 Humidification: If humidification is provided during heating, it shall be designed for a maximum relative humidity of thirty percent. When comfort air conditioning is provided, the actual design relative humidity within the comfort envelope as defined in Standard RS-4, listed in Chapter 7, shall be selected for minimum total HVAC system energy use.

302.3 Climate Zones: All buildings shall comply with the requirements of the appropriate climate zone as defined herein.

ZONE 1: Climate Zone 1 shall include all counties not included in Climate Zone 2.

ZONE 2: Climate Zone 2 shall include: Adams, Chelan, Douglas, Ferry, Grant, Kittitas, Lincoln, Okanogan, Pend Oreille, Spokane, Stevens, and Whitman counties.

TABLE 3-1
OUTDOOR DESIGN TEMPERATURES

Location	Outdoor Design Temp. (in °F) (heating)	Outdoor Design Temp. (in °F) (cooling)
Aberdeen 20 NNE	25.0	83
Anacortes	24.0	72
Anatone	-4.0	89
Auburn	25.0	84
Battleground	19.0	91
Bellevue	24.0	83
Bellingham 2 N	19.0	78
Blaine	17.0	73
Bremerton	29.0	83
Burlington	19.0	77
Chehalis	21.0	87
Chelan	10.0	89
Cheney	4.0	94
Chesaw	-11.0	81
Clarkston	10.0	94
Cle Elum	1.0	91
Colfax 1 NW	2.0	94
Colville AP	-2.0	92
Concrete	19.0	83
Connell 4 NNW	6.0	100
Cougar 5 E	25.0	93

Location	Outdoor Design Temp. (in °F) (heating)	Outdoor Design Temp. (in °F) (cooling)
Dallesport AP	14.0	99
Darrington RS	13.0	85
Davenport	5.0	92
Edmonds	24.0	82
Ellensburg AP	2.0	90
Elma	24.0	88
Ephrata AP	7.0	97
Everett Paine AFB	21.0	79
Forks 1 E	23.0	81
Glacier RS	13.0	82
Glenoma (Kosmos)	18.0	89
Goldendale	7.0	94
Grays River Hatchery	24.0	86
Greenwater	1.4	84
Grotto	21.0	84
Hoquiam AP	26.0	79
Inchelium 2 NW	0.0	92
John Day Dam	19.0	100
Kent	21.0	85
Kirkland	17.0	83
La Grande	23.0	88
Leavenworth	-3.0	93
Little Goose Dam	22.0	101
Long Beach 3 NNE	25.0	77
Longview	24.0	87
Lower Granite Dam	14.0	98
Lower Monument Dam	18.0	103
Marysville	23.0	79
Metaline Falls	-1.0	89
Methow 2 W	1.0	89
Nespelem 2 S	-4.0	93
Newhalem	19.0	89
Newport	-5.0	92
Northport	2.0	92
Oak Harbor	16.0	74
Odessa	7.0	100
Olga 2 SE	24.0	71
Olympia, AP	17.0	85
Omak 2 NW	3.0	90
Oroville	5.0	93
Othello	9.0	98
Packwood	16.0	90
Plain	-3.0	89
Pleasant View	16.0	98
Pomeroy	3.0	95
Port Angeles	28.0	75
Port Townsend	25.0	76
Prosser	12.0	97
Puyallup	19.0	86
Quilcene 2 SW	23.0	83
Quinault RS	25.0	84
Rainier, Longmire	15.0	85
Paradise RS	8.0	71
Raymond	28.0	81
Redmond	17.0	83
Republic	-9.0	87
Richland	11.0	101
Ritzville	6.0	99
Satus Pass	10.0	90
Seattle: Sea-Tac AP	24.0	83
Sedro Woolley 1 E	19.0	78
Sequim	23.0	78
Shelton	23.0	85
Smyrna	8.0	102
Snohomish	21.0	81
Snoqualmie Pass	6.0	80
Spokane AP	4.0	92
Spokane CO	10.0	96
Stampede Pass	7.0	76
Stehekin 3 NW	12.0	85
Stevens Pass	6.0	77
Tacoma CO	29.0	82
Tatoosh Island	31.0	63
Toledo AP	17.0	84
Vancouver	22.0	88
Vashon Island	28.0	78
Walla Walla AP	6.0	96
Waterville	1.0	88
Wellpinit	1.0	93
Wenatchee CO	10.0	92
Whidbey Island	11.0	71
Willapa Harbor	26.0	81
Wilson Creek	3.0	96
Winthrop 1 WSW	-12.0	91
Yakima AP	11.0	94

[Statutory Authority: RCW 19.27A.025, 19.27A.045. 10-03-115, 10-13-113 and 10-22-056, § 51-11-0302, filed 1/20/10, 6/21/10 and 10/28/10, effective 1/11/11. Statutory Authority: RCW 19.27A.020 and 1990 c 2. 91-01-112, § 51-11-0302, filed 12/19/90, effective 7/1/91.]

Reviser's note: Notice of Objection: The Joint Administrative Rules Review Committee (Committee) finds that, in adopting the 2009 proposed changes to the State Energy Code, Chapter 51-11 WAC, on November 20, 2009, the State Building Code Council (Council) failed to comply with all requirements of the law and failed to adequately respond to the Committee's request for additional economic impact and cost-benefit analyses prior to adoption.

On October 1, 2009, the Committee found that the Small Business Economic Impact Statement (SBEIS) for the proposed changes filed with the Code Reviser failed to comply with all requirements of law. The Committee requested that the Council conduct a cost-benefit analysis pursuant to RCW 34.05.328 and amend the SBEIS to provide additional economic impact information, including an estimate of the number of jobs that would be created or lost as a result of compliance with all the proposed rules, as required by RCW 19.85.040 (2)(d).

The Council provided the Committee with information and data on November 18, 2009. On December 2, 2009, the Committee found that the Council failed to adequately respond to the Committee's request for additional data. Specifically, the Committee found that the Council failed to amend the SBEIS to (a) estimate the number of jobs that would be created or lost as a result of compliance with the proposed changes; and (b) support the SBEIS with a detailed and rigorous costs analysis of the cumulative impact of all the changes. In addition, the Committee found that the Council failed to provide the Committee with a cost-benefit analysis of the proposed changes and pursuant to the requirements of RCW 34.05.328.

The Committee strongly supports a process that makes thoughtful and informed progress towards changes that result in improved energy efficiency in our buildings, wherever practicable. While the Council worked diligently,

it is the opinion of the Committee that the Council did not fully develop and consider the economic impacts and costs versus benefits of these significant changes to our Energy Code. Furthermore, it is the opinion of the Committee that the Council and the Legislature need this information to fully evaluate the value, impacts, and consequences of the proposed codes, with due diligence to their respective fiduciary responsibilities, in order to create the best informed public policy.

As a result, the Committee recommends that the Governor suspend the adoption and implementation of the changes to the Energy Code, Chapter 51-11 WAC, adopted by the Council on November 20, 2009, until such time as a more adequate analysis has been completed and considered by the appropriate bodies.

For all of the above stated reasons, the Committee objects to the changes to the State Energy Code, Chapter 51-11 WAC, that were adopted by the Council on November 20, 2009, and hereby directs the Code Reviser, pursuant to RCW 34.05.640(4), to publish this Notice of Objection in the Washington State Register and along with any publication in the Washington Administrative Code of changes to Chapter 51-11 WAC that were adopted by the Council in 2009 and filed with the Code Reviser.

WAC 51-11-0303 Mechanical ventilation.

The minimum requirements for ventilation shall comply with Section M1508 of the Washington State Residential Code. (WAC 51-51.)

[Statutory Authority: RCW 19.27A.025, 19.27A.045. 10-03-115, 10-13-113 and 10-22-056, § 51-11-0303, filed 1/20/10, 6/21/10 and 10/28/10, effective 1/1/11. Statutory Authority: RCW 19.27A.020 and 1990 c 2. 91-01-112, § 51-11-0303, filed 12/19/90, effective 7/1/91.]

Reviser's note: Notice of Objection: The Joint Administrative Rules Review Committee (Committee) finds that, in adopting the 2009 proposed changes to the State Energy Code, Chapter 51-11 WAC, on November 20, 2009, the State Building Code Council (Council) failed to comply with all requirements of the law and failed to adequately respond to the Committee's request for additional economic impact and cost-benefit analyses prior to adoption.

On October 1, 2009, the Committee found that the Small Business Economic Impact Statement (SBEIS) for the proposed changes filed with the Code Reviser failed to comply with all requirements of law. The Committee requested that the Council conduct a cost-benefit analysis pursuant to RCW 34.05.328 and amend the SBEIS to provide additional economic impact information, including an estimate of the number of jobs that would be created or lost as a result of compliance with all the proposed rules, as required by RCW 19.85.040 (2)(d).

The Council provided the Committee with information and data on November 18, 2009. On December 2, 2009, the Committee found that the Council failed to adequately respond to the Committee's request for additional data. Specifically, the Committee found that the Council failed to amend the SBEIS to (a) estimate the number of jobs that would be created or lost as a result of compliance with the proposed changes; and (b) support the SBEIS with a detailed and rigorous costs analysis of the cumulative impact of all the changes. In addition, the Committee found that the Council failed to provide the Committee with a cost-benefit analysis of the proposed changes and pursuant to the requirements of RCW 34.05.328.

The Committee strongly supports a process that makes thoughtful and informed progress towards changes that result in improved energy efficiency in our buildings, wherever practicable. While the Council worked diligently, it is the opinion of the Committee that the Council did not fully develop and consider the economic impacts and costs versus benefits of these significant changes to our Energy Code. Furthermore, it is the opinion of the Committee that the Council and the Legislature need this information to fully evaluate the value, impacts, and consequences of the proposed codes, with due diligence to their respective fiduciary responsibilities, in order to create the best informed public policy.

As a result, the Committee recommends that the Governor suspend the adoption and implementation of the changes to the Energy Code, Chapter 51-11 WAC, adopted by the Council on November 20, 2009, until such time as a more adequate analysis has been completed and considered by the appropriate bodies.

For all of the above stated reasons, the Committee objects to the changes to the State Energy Code, Chapter 51-11 WAC, that were adopted by the Council on November 20, 2009, and hereby directs the Code Reviser, pursuant to RCW 34.05.640(4), to publish this Notice of Objection in the Washington State Register and along with any publication in the Washington Administrative Code of changes to Chapter 51-11 WAC that were adopted by the Council in 2009 and filed with the Code Reviser.

WAC 51-11-0401 Scope.

401.1 General: This chapter establishes design criteria in terms of total energy use by a building, including all of its systems. Analysis of design for all single-family residential shall comply with Sections 402.1 to 402.6. In addition, the design shall comply with the additional energy efficiency requirements of Chapter 9.

[Statutory Authority: RCW 19.27A.025, 19.27A.045. 10-03-115, 10-13-113 and 10-22-056, § 51-11-0401, filed 1/20/10, 6/21/10 and 10/28/10, effective 1/1/11. Statutory Authority: RCW 19.27A.025. 93-21-052, § 51-11-0401, filed 10/18/93, effective 4/1/94. Statutory Authority: RCW 19.27A.020 and 1990 c 2. 91-01-112, § 51-11-0401, filed 12/19/90, effective 7/1/91.]

Reviser's note: Notice of Objection: The Joint Administrative Rules Review Committee (Committee) finds that, in adopting the 2009 proposed changes to the State Energy Code, Chapter 51-11 WAC, on November 20, 2009, the State Building Code Council (Council) failed to comply with all requirements of the law and failed to adequately respond to the Committee's request for additional economic impact and cost-benefit analyses prior to adoption.

On October 1, 2009, the Committee found that the Small Business Economic Impact Statement (SBEIS) for the proposed changes filed with the Code Reviser failed to comply with all requirements of law. The Committee requested that the Council conduct a cost-benefit analysis pursuant to RCW 34.05.328 and amend the SBEIS to provide additional economic impact information, including an estimate of the number of jobs that would be created or lost as a result of compliance with all the proposed rules, as required by RCW 19.85.040 (2)(d).

The Council provided the Committee with information and data on November 18, 2009. On December 2, 2009, the Committee found that the Council failed to adequately respond to the Committee's request for additional data. Specifically, the Committee found that the Council failed to amend the SBEIS to (a) estimate the number of jobs that would be created or lost as a result of compliance with the proposed changes; and (b) support the SBEIS with a detailed and rigorous costs analysis of the cumulative impact of all the changes. In addition, the Committee found that the Council failed to provide the Committee with a cost-benefit analysis of the proposed changes and pursuant to the requirements of RCW 34.05.328.

The Committee strongly supports a process that makes thoughtful and informed progress towards changes that result in improved energy efficiency in our buildings, wherever practicable. While the Council worked diligently, it is the opinion of the Committee that the Council did not fully develop and consider the economic impacts and costs versus benefits of these significant changes to our Energy Code. Furthermore, it is the opinion of the Committee that the Council and the Legislature need this information to fully evaluate the value, impacts, and consequences of the proposed codes, with due diligence to their respective fiduciary responsibilities, in order to create the best informed public policy.

As a result, the Committee recommends that the Governor suspend the adoption and implementation of the changes to the Energy Code, Chapter 51-11 WAC, adopted by the Council on November 20, 2009, until such time as a more adequate analysis has been completed and considered by the appropriate bodies.

For all of the above stated reasons, the Committee objects to the changes to the State Energy Code, Chapter 51-11 WAC, that were adopted by the Council on November 20, 2009, and hereby directs the Code Reviser, pursuant to RCW 34.05.640(4), to publish this Notice of Objection in the Washington State Register and along with any publication in the Washington Administrative Code of changes to Chapter 51-11 WAC that were adopted by the Council in 2009 and filed with the Code Reviser.

WAC 51-11-0402 Systems analysis.

402.1 Special Requirements for Single-Family Residential:

402.1.1 Energy Budgets: Proposed buildings designed in accordance with this section shall be designed to use no more energy from nonrenewable sources for space heating, space cooling and domestic hot water heating than a standard building whose enclosure elements and energy consuming systems are designed in accordance with section 502.2 of this Code for the appropriate climate zone, and heating system type and cooling system and whose mechanical system type is the same as the proposed building and which complies with Section 503 of this Code. Energy derived from renewable sources may be excluded from the total annual energy consumption attributed to the alternative building.

402.1.2 Calculation of Energy Consumption: The application for a building permit shall include documentation which demonstrates, using a calculation procedure as listed in Chapter 8, or an approved alternate, that the proposed building's annual space heating, space cooling and domestic hot water heating energy use does not exceed the annual space heating, space cooling and domestic hot water heating energy use of a standard building conforming to Chapter 5 of this Code for the appropriate climate zone. The total calculated annual energy consumption shall be shown in units of kWh/ft^2-yr or Btu/ft^2-yr of conditioned area.

402.1.3 Input Values: The following standardized input values shall be used in calculating annual space heating budgets:

PARAMETER	VALUE
Thermostat set point, heating	65° F
Thermostat set point, cooling	78° F
Thermostat night set back	65° F
Thermostat night set back period	0 hours
Internal gain	3000 Btu/h
Domestic Hot Water Heater Setpoint	120° F
Domestic Hot Water Consumption	20 gallons/person/day.
Minimum heat storage	Calculated using standard engineering practice for the actual building or as approved.
Site weather data	Typical meteorological year (TMY) or ersatz TMY data for the closest appropriate TMY site or other sites as approved.
Heating and cooling equipment efficiency	Equipment shall comply with Section 1411.

The standard building shall be modeled with glazing area distributed equally among the four cardinal directions. Parameter values that may be varied by the building designer to model energy saving options include, but are not limited to, the following:

1. Overall thermal transmittance, U_o, of building envelope or individual building components;

2. Heat storage capacity of building;

3. Glazing orientation; area; and solar heat coefficients; (where Chapter 5 does not contain SHGC requirements, the standard design shall be modeled with glazing SHGC as determined by Tables 13-1 and 13-2. SHGC values shall be determined in accordance with Section 1312.2.)

4. Heating system efficiency.

Parameter values that may not be varied:

• Domestic hot water consumption.

402.1.4 Solar Shading and Access: Building designs using passive solar features with eight percent or more south facing equivalent glazing to qualify shall provide to the building official a sun chart or other approved documentation depicting actual site shading for use in calculating compliance under this section. The building shall contain at least forty-five Btu/°F for each square foot of south facing glass.

402.1.5 Infiltration: Infiltration levels used shall be set at 0.35 air changes per hour for thermal calculation purposes only.

402.1.6 Heat Pumps: The heating season performance factor (HSPF) for heat pumps shall be calculated using procedures consistent with section 5.2 of the U.S. Department of Energy Test Procedure for Central Air Conditioners, including heat pumps published in the December 27, 1979 Federal Register Vol. 44, No. 24.10 CFR 430. Climate data as specified above, the proposed buildings overall thermal performance value (Btu/°F) and the standardized input assumptions specified above shall be used to model the heat pumps HSPF.

402.2 Energy Analysis: Compliance with this chapter will require an analysis of the annual energy usage, hereinafter called an annual energy analysis.

EXCEPTIONS: Chapters 5, and 6 of this Code establish criteria for different energy-consuming and enclosure elements of the building which, will eliminate the requirement for an annual systems energy analysis while meeting the intent of this Code.

A building designed in accordance with this chapter will be deemed as complying with this Code if the calculated annual energy consumption is 8 percent less than a similar building (defined as a "standard design") whose enclosure elements and energy-consuming systems are designed in accordance with Chapter 5.

For an alternate building design to be considered similar to a "standard design," it shall utilize the same energy source(s) for the same functions and have equal floor area and the same ratio of envelope area to floor area, environmental requirements, occupancy, climate data and usage operational schedule.

402.3 Design: The standard design, conforming to the criteria of Chapter 5 and the proposed alternative design shall be designed on a common basis as specified herein:

The comparison shall be expressed as kBtu or kWh input per square foot of conditioned floor area per year at the building site.

402.4 Analysis Procedure: The analysis of the annual energy usage of the standard and the proposed alternative building and system design shall meet the following criteria:

a. The building heating/cooling load calculation procedure used for annual energy consumption analysis shall be detailed to permit the evaluation of effect of factors specified in section 402.5.

b. The calculation procedure used to simulate the operation of the building and its service systems through a full-year operating period shall be detailed to permit the evaluation of the effect of system design, climatic factors, operational characteristics, and mechanical equipment on annual energy usage. Manufacturer's data or comparable field test data shall be used when available in the simulation of systems and equipment. The calculation procedure shall be based upon eight thousand seven hundred sixty hours of operation of the building and its service systems.

402.5 Calculation Procedure: The calculation procedure shall cover the following items:

a. Design requirements—Environmental requirements as required in Chapter 3.

b. Climatic data—Coincident hourly data for temperatures, solar radiation, wind and humidity of typical days in the year representing seasonal variation.

c. Building data—Orientation, size, shape, mass, air, moisture and heat transfer characteristics.

d. Operational characteristics—Temperature, humidity, ventilation, illumination, control mode for occupied and unoccupied hours.

e. Mechanical equipment—Design capacity, part load profile.

f. Building loads—Internal heat generation, lighting, equipment, number of people during occupied and unoccupied periods.

EXCEPTION: Single-family residential shall comply with calculation procedures in Chapter 8, or an approved alternate.

402.6 Documentation: Proposed alternative designs, submitted as requests for exception to the standard design criteria, shall be accompanied by an energy analysis comparison report. The report shall provide technical detail on the two building and system designs and on the data used in and resulting from the comparative analysis to verify that both the analysis and the designs meet the criteria of Chapter 4 of this Code.

[Statutory Authority: RCW 19.27A.025, 19.27A.045. 10-22-057, § 51-11-0402, filed 10/28/10, effective 1/1/11; 10-03-115, 10-13-113 and 10-22-056, § 51-11-0402, filed 1/20/10, 6/21/10 and 10/28/10, effective 1/1/11. Statutory Authority: RCW 19.27A.022, 19.27A.025, 19.27A.045, and chapters 19.27 and 34.05 RCW. 07-01-089, § 51-11-0402, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27A.020, 19.27A.045. 04-01-106, § 51-11-0402, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27A.025 and 19.27A.045. 98-03-003, § 51-11-0402, filed 1/8/98, effective 7/1/98. Statutory Authority: Chapters 19.27, 19.27A and 34.05 RCW. 94-05-059, § 51-11-0402, filed 2/10/94, effective 4/1/94. Statutory Authority: RCW 19.27A.020 and 1990 c 2. 91-01-112, § 51-11-0402, filed 12/19/90, effective 7/1/91.]

Reviser's note: Notice of Objection: The Joint Administrative Rules Review Committee (Committee) finds that, in adopting the 2009 proposed changes to the State Energy Code, Chapter 51-11 WAC, on November 20, 2009, the State Building Code Council (Council) failed to comply with all requirements of the law and failed to adequately respond to the Committee's request for additional economic impact and cost-benefit analyses prior to adoption.

On October 1, 2009, the Committee found that the Small Business Economic Impact Statement (SBEIS) for the proposed changes filed with the Code Reviser failed to comply with all requirements of law. The Committee requested that the Council conduct a cost-benefit analysis pursuant to RCW 34.05.328 and amend the SBEIS to provide additional economic impact information, including an estimate of the number of jobs that would be created or lost as a result of compliance with all the proposed rules, as required by RCW 19.85.040 (2)(d).

The Council provided the Committee with information and data on November 18, 2009. On December 2, 2009, the Committee found that the Council failed to adequately respond to the Committee's request for additional data. Specifically, the Committee found that the Council failed to amend the SBEIS to (a) estimate the number of jobs that would be created or lost as a result of compliance with the proposed changes; and (b) support the SBEIS with a detailed and rigorous costs analysis of the cumulative impact of all the changes. In addition, the Committee found that the Council failed to provide the Committee with a cost-benefit analysis of the proposed changes and pursuant to the requirements of RCW 34.05.328.

The Committee strongly supports a process that makes thoughtful and informed progress towards changes that result in improved energy efficiency in our buildings, wherever practicable. While the Council worked diligently, it is the opinion of the Committee that the Council did not fully develop and consider the economic impacts and costs versus benefits of these significant changes to our Energy Code. Furthermore, it is the opinion of the Committee that the Council and the Legislature need this information to fully evaluate the value, impacts, and consequences of the proposed codes, with due diligence to their respective fiduciary responsibilities, in order to create the best informed public policy.

As a result, the Committee recommends that the Governor suspend the adoption and implementation of the changes to the Energy Code, Chapter 51-11 WAC, adopted by the Council on November 20, 2009, until such time as a more adequate analysis has been completed and considered by the appropriate bodies.

For all of the above stated reasons, the Committee objects to the changes to the State Energy Code, Chapter 51-11 WAC, that were adopted by the Council on November 20, 2009, and hereby directs the Code Reviser, pursuant to RCW 34.05.640(4), to publish this Notice of Objection in the Washington State Register and along with any publication in the Washington Administrative Code of changes to Chapter 51-11 WAC that were adopted by the Council in 2009 and filed with the Code Reviser.

WAC 51-11-0501 Scope.

501.1 General: Buildings that are heated or mechanically cooled shall be constructed so as to provide the required thermal performance of the various components. A building that is designed to be both heated and cooled shall meet the more stringent of the heating or cooling requirements as provided in this Code when requirements of the exterior envelope differ. In addition, the design shall comply with the additional energy efficiency requirements of Chapter 9.

[Statutory Authority: RCW 19.27A.025, 19.27A.045. 10-03-115, 10-13-113 and 10-22-056, § 51-11-0501, filed 1/20/10, 6/21/10 and 10/28/10, effective 1/1/11. Statutory Authority: RCW 19.27A.020 and 1990 c 2. 91-01-112, § 51-11-0501, filed 12/19/90, effective 7/1/91.]

Reviser's note: Notice of Objection: The Joint Administrative Rules Review Committee (Committee) finds that, in adopting the 2009 proposed changes to the State Energy Code, Chapter 51-11 WAC, on November 20, 2009, the State Building Code Council (Council) failed to comply with all requirements of the law and failed to adequately respond to the Committee's request for additional economic impact and cost-benefit analyses prior to adoption.

On October 1, 2009, the Committee found that the Small Business Economic Impact Statement (SBEIS) for the proposed changes filed with the Code Reviser failed to comply with all requirements of law. The Committee requested that the Council conduct a cost-benefit analysis pursuant to RCW 34.05.328 and amend the SBEIS to provide additional economic impact information, including an estimate of the number of jobs that would be created or lost as a result of compliance with all the proposed rules, as required by RCW 19.85.040 (2)(d).

The Council provided the Committee with information and data on November 18, 2009. On December 2, 2009, the Committee found that the Council failed to adequately respond to the Committee's request for additional data. Specifically, the Committee found that the Council failed to amend the SBEIS to (a) estimate the number of jobs that would be created or lost as a result of compliance with the proposed changes; and (b) support the SBEIS with a detailed and rigorous costs analysis of the cumulative impact of all the changes. In addition, the Committee found that the Council failed to provide the Committee with a cost-benefit analysis of the proposed changes and pursuant to the requirements of RCW 34.05.328.

The Committee strongly supports a process that makes thoughtful and informed progress towards changes that result in improved energy efficiency in our buildings, wherever practicable. While the Council worked diligently, it is the opinion of the Committee that the Council did not fully develop and consider the economic impacts and costs versus benefits of these significant changes to our Energy Code. Furthermore, it is the opinion of the Committee that the Council and the Legislature need this information to fully evaluate the value, impacts, and consequences of the proposed codes, with due diligence to their respective fiduciary responsibilities, in order to create the best informed public policy.

As a result, the Committee recommends that the Governor suspend the adoption and implementation of the changes to the Energy Code, Chapter 51-11 WAC, adopted by the Council on November 20, 2009, until such time as a more adequate analysis has been completed and considered by the appropriate bodies.

For all of the above stated reasons, the Committee objects to the changes to the State Energy Code, Chapter 51-11 WAC, that were adopted by the Council on November 20, 2009, and hereby directs the Code Reviser, pursuant to RCW 34.05.640(4), to publish this Notice of Objection in the Washington State Register and along with any publication in the Washington Administrative Code of changes to Chapter 51-11 WAC that were adopted by the Council in 2009 and filed with the Code Reviser.

WAC 51-11-0502 Building envelope requirements.

502.1 General:

502.1.1: The stated U- or F-factor of any component assembly, listed in Table 5-1, such as roof/ceiling, opaque wall or opaque floor may be increased and the U-factor for other components decreased, provided that the total heat gain or loss for the entire building envelope does not exceed the total resulting from compliance to the U-factors specified in this section.

The U-factors for typical construction assemblies are included in Chapter 10. These values shall be used for all calculations. Where proposed construction assemblies are not represented in Chapter 10, values shall be calculated in accordance with Chapters 16 through 18 and 25 through 27 in Standard RS-1 listed in Chapter 7, using the framing factors listed in Chapter 10 where applicable.

For envelope assemblies containing metal framing, the U-factor shall be determined by one of the following methods:

1. Results of laboratory or field measurements.

2. Standard RS-1, listed in Chapter 7, where the metal framing is bonded on one or both sides to a metal skin or covering.

3. The zone method as provided in Chapter 27 of Standard RS-1, listed in Chapter 7.

4. Results of parallel path correction factors effective framing/cavity R-values as provided in Table 10-5A - EFFECTIVE R-VALUES FOR METAL FRAMING AND CAVITY ONLY for metal stud walls and roof/ceilings.

502.1.2: For consideration of thermal mass effects, see section 402.4.

502.1.3: When return air ceiling plenums are employed, the roof/ceiling assembly shall:

a. For thermal transmittance purposes, not include the ceiling proper nor the plenum space as part of the assembly; and

b. For gross area purposes, be based upon the interior face of the upper plenum surface.

502.1.4 Insulation:

502.1.4.1 General: All insulating materials shall comply with sections 2603 and/or 719 of the International Building Code. Substantial contact of the insulation with the surface being insulated is required. All insulation materials shall be installed according to the manufacturer's instructions to achieve proper densities and maintain uniform R-values and shall be installed in a manner which will permit inspection of the manufacturer's R-value identification mark. To the maximum extent possible, insulation shall extend over the full component area to the intended R-value.

The thickness of roof/ceiling insulation that is either blown in or spray-applied shall be identified by inches of thickness, density and R-value markers installed at least one for every 300 square feet (28 m^2) through the attic, ceiling space. In attics, the markers shall be affixed to the trusses or joists and marked with the minimum initial installed thickness with numbers a minimum 1.0 inch (25 mm) in height. Each marker shall face the attic access. The thickness of installed attic insulation shall meet or exceed the minimum initial installed thickness shown by the marker.

502.1.4.2 Insulation Materials: All insulation materials including facings such as vapor barriers or breather papers installed within floor/ceiling assemblies, roof/ceiling assemblies, walls, crawl spaces, or attics shall have a flame spread rating of less than 25 and a smoke density not to exceed 450 when tested in accordance with ASTM E84-01.

EXCEPTIONS:
1. Foam plastic insulation shall comply with section 2603 of the International Building Code.
2. When such materials are installed in concealed spaces of Types III, IV and V construction, the flame spread and smoke developed limitations do not apply to facing, provided that the facing is installed in substantial contact with the unexposed surface of the ceiling, floor or wall finish.
3. Cellulose insulation shall comply with section 719 of the International Building Code.

502.1.4.3 Clearances: Where required, insulation shall be installed with clearances according to manufacturer's specifications. Insulation shall be installed so that required ventilation is unobstructed. For blown or poured loose fill insulation, clearances shall be maintained through installation of a permanent retainer.

502.1.4.4 Access Hatches and Doors: Access doors from conditioned spaces to unconditioned spaces (e.g., attics and crawl spaces) shall be weatherstripped and insulated to a level equivalent to the insulation on the surrounding surfaces. Access shall be provided to all equipment which prevents damaging or compressing the insulation. A wood framed or equivalent baffle or retainer must be provided when loose fill insulation is installed, the purpose of which is to prevent the loose fill insulation from spilling into the living space when the attic access is opened, and to provide a permanent means of maintaining the installed R-value of the loose fill insulation.

502.1.4.5 Roof/Ceiling Insulation: Where two or more layers of rigid board insulation are used in a roof assembly, the vertical joints between each layer shall be staggered. Open-blown or poured loose fill insulation may be used in attic spaces where the slope of the ceiling is not more than 3 feet in 12 and there is at least 30 inches of clear distance from the top of the bottom chord of the truss or ceiling joist to the underside of the sheathing at the roof ridge. When eave vents are installed, baffling of the vent openings shall be provided so as to deflect the incoming air above the surface of the insulation. Baffles shall be, rigid material, resistant to wind driven moisture. Requirements for baffles for ceiling insulation shall meet the International Building Code section 1203.2 for minimum ventilation requirements. When feasible, the baffles shall be installed from the top of the outside of the exterior wall, extending inward, to a point 6 inches vertically above the height of noncompressed insulation, and 12 inches vertically above loose fill insulation.

502.1.4.6 Wall Insulation: Insulation installed in exterior walls shall comply with the provisions of this section. All wall insulation shall fill the entire framed cavity. Exterior wall cavities isolated during framing shall be fully insulated to the levels of the surrounding walls. All faced insulation shall be face stapled to avoid compression.

EXCEPTION: Framed cavity can be empty or partially filled provided:

1. The wall assembly calculations are performed along with a completed performance calculation for the whole building; and
2. Insulation installed in partially filled cavities is not included in the performance calculation.

502.1.4.7 Floor Insulation: Floor insulation shall be installed in a permanent manner in substantial contact with the surface being insulated. Insulation supports shall be installed so spacing is no more than 24 inches on center. Foundation vents shall be placed so that the top of the vent is below the lower surface of the floor insulation.

EXCEPTIONS:

1. Insulation may be omitted from floor areas over heated basements, heated garages or underfloor areas used as HVAC supply plenums. When foundation walls are insulated, the insulation shall be attached in a permanent manner. The insulation shall not block the airflow through foundation vents when installed. When foundation vents are not placed so that the top of the vent is below the lower surface of the floor insulation, a permanently attached baffle shall be installed at an angle of 30° from horizontal, to divert air flow below the lower surface of the floor insulation.
2. Substantial contact with the surface being insulated is not required in enclosed floor/ceiling assemblies containing ducts where full depth insulation is installed between the duct and the exterior surface.

502.1.4.8 Slab-On-Grade: Slab-on-grade insulation shall be placed on the outside of the foundation or on the inside of the foundation wall. The insulation shall extend downward from the top of the slab for a minimum distance of 24 inches or downward to at least the bottom of the slab and then horizontally to the interior or exterior for the total distance of 24 inches. Above grade insulation shall be protected. A 2-inch by 2-inch (maximum) nailer may be placed at the finished floor elevation for attachment of interior finish materials.

502.1.4.9 Radiant Slabs: The entire area of a radiant slab shall be thermally isolated from the soil, with a minimum of R-10 insulation. The insulation shall be an approved product for its intended use. If a soil gas control system is present below the radiant slab, which results in increased convective flow below the radiant slab, the radiant slab shall be thermally isolated from the sub-slab gravel layer. R-10 radiant slab insulation is required for all compliance paths.

502.1.4.10 Below Grade Walls: Below grade exterior wall insulation used on the exterior (cold) side of the wall shall extend from the top of the below grade wall to the top of the footing and shall be approved for below grade use. Above grade insulation shall be protected.

Insulation used on the interior (warm) side of the wall shall extend from the top of the below grade wall to the below grade floor level.

502.1.5 Glazing and Door U-factors: Glazing and door U-factors shall be determined in accordance with sections 502.1.5.1 and 502.1.5.2. All products shall be labeled with the NFRC certified or default U-factor. The labeled U-factor shall be used in all calculations to determine compliance with this Code. Sealed insulating glass shall conform to, or be in test for, ASTM E-774-81 class A.

502.1.5.1 Standard Procedure for Determination of Glazing U-factors: U-factors for glazing shall be determined, certified and labeled in accordance with the National Fenestration Rating Council (NFRC) Product Certification Program (PCP), as authorized by an independent certification and inspection agency licensed by the NFRC. Compliance shall be based on the Residential Model Size. Product samples used for U-factor determinations shall be production line units or representative of units as purchased by the consumer or contractor. Products that are listed in the NFRC Certified Products Directory or certified to the NFRC standard shall not use default values.

EXCEPTIONS:

1. Glazing products without NFRC ratings may be assigned default U-factors from Table 10-6A for vertical glazing and from Table 10-6E for overhead glazing.
2. Units without NFRC ratings produced by a small business may be assigned default U-factors from Table 10-6A for garden windows, from Table 10-6B for other vertical glazing, and from Table 10-6E for overhead glazing.

502.1.5.2 Standard Procedure for Determination of Door U-factors: All doors, including fire doors, shall be assigned default U-factors from Table 10-6C.

EXCEPTIONS:

1. U-factors determined, certified and labeled in accordance with the National Fenestration Rating Council (NFRC) Product Certification Program

(PCP), as authorized by an independent certification and inspection agency licensed by the NFRC.
2. The default values for the opaque portions of doors shall be those listed in Table 10-6C, provided that the U-factor listed for a door with a thermal break shall only be allowed if both the door and the frame have a thermal break.
3. One unlabeled or untested exterior swinging door with the maximum area of 24 square feet may be installed for ornamental, security or architectural purposes. Products using this exception shall not be included in the U-factor calculation requirements, however glazing area shall be included in glazing area calculations.

502.1.6 Moisture Control:

502.1.6.1 Vapor Retarders: Vapor retarders shall be installed on the warm side (in winter) of insulation as specified in the following cases.

EXCEPTION: Vapor retarder installed with not more than 1/3 of the nominal R-value between it and the conditioned space.

502.1.6.2 Floors: Floors separating conditioned space from unconditioned space shall have a vapor retarder installed. The vapor retarder shall have a one perm dry cup rating or less (i.e., four mil (0.004 inch thick) polyethylene or kraft faced material).

502.1.6.3 Roof/Ceilings: Roof/ceiling assemblies where the ventilation space above the insulation is less than an average of 12 inches shall be provided with a vapor retarder. Faced batt insulation where used as a vapor retarder shall be face stapled. Single rafter joist vaulted ceiling cavities shall be of sufficient depth to allow a minimum one inch vented air space above the insulation.

EXCEPTION: Unvented attic assemblies (spaces between the ceiling joists of the top story and the roof rafters) shall be permitted if all the following conditions are met:
1. The unvented attic space is completely contained within the building thermal envelope.
2. No interior vapor retarders are installed on the ceiling side (attic floor) of the unvented attic assembly.
3. Where wood shingles or shakes are used, a minimum 1/4 inch (6 mm) vented air space separates the shingles or shakes and the roofing underlayment above the structural sheathing.
4. Any air-impermeable insulation shall be a vapor retarder, or shall have a vapor retarder coating or covering in direct contact with the underside of the insulation.
5. Either items a, b or c shall be met, depending on the air permeability of the insulation directly under the structural roof sheathing.
a. Air-impermeable insulation only. Insulation shall be applied in direct contact to the underside of the structural roof sheathing.
b. Air-permeable insulation only. In addition to the air-permeable insulation installed directly below the structural sheathing, rigid board or sheet insulation shall be installed directly above the structural roof sheathing as specified per WA Climate Zone for condensation control.
i. Climate Zone #1 R-10 minimum rigid board or air-impermeable insulation R-value.
ii. Climate Zone #2 R-25 minimum rigid board or air-impermeable insulation R-value.
c. Air-impermeable and air-permeable insulation. The air-impermeable insulation shall be applied in direct contact to the underside of the structural roof sheathing as specified per WA Climate Zone for condensation control. The air-permeable insulation shall be installed directly under the air-impermeable insulation.
i. Climate Zone #1 R-10 minimum rigid board or air-impermeable insulation R-value.
ii. Climate Zone #2 R-25 minimum rigid board or air-impermeable insulation R-value.

502.1.6.4: Vapor retarders shall not be required in roof/ceiling assemblies where the ventilation space above the insulation averages 12 inches or greater.

502.1.6.5: Vapor retarders shall not be required where all of the insulation is installed between the roof membrane and the structural roof deck.

502.1.6.6 Walls: Walls separating conditioned space from unconditioned space shall have a vapor retarder installed. Faced batt insulation shall be face stapled.

EXCEPTION: For climate zone 1, wood framed walls with a minimum of nominal R-5 continuous insulated sheathing installed outside of the framing and structural sheathing. For climate zone 2, wood framed walls with a minimum of nominal R-7.5 continuous insulated sheathing installed outside of the framing and structural sheathing. The interior cavity insulation for this exception shall be a maximum of nominal R-21.

502.1.6.7 Ground Cover: A ground cover of six mil (0.006 inch thick) black polyethylene or approved equal shall be laid over the ground within crawl spaces. The ground cover shall be overlapped 12 inches minimum at the joints and shall extend to the foundation wall.

EXCEPTION: The ground cover may be omitted in crawl spaces if the crawl space has a concrete slab floor with a minimum thickness of 3-1/2 inches.

502.2 Thermal Criteria for Single-Family Residential:

502.2.1 UA Calculations: The proposed UA as calculated using Equations 2 and 3 shall not exceed the target UA as calculated using Equation 1. For the purpose of determining equivalent thermal performance, the glazing area for the target UA shall be calculated using values in Table 5-1. The opaque door area shall be the same in the target UA and the proposed UA. When showing compliance with Table 9-1 using options 3a, 3b or 3c, the proposed design shall be less than the target UA by the fraction noted in the table.

EXCEPTION: Log and solid timber walls that have a minimum average thickness of 3.5" and with space heat type other than electric resistance, are exempt from wall target UA and proposed UA calculations.

502.2.2 Space Heat Type: The following two categories comprise all space heating types:

1. Electric Resistance: Space heating systems which include baseboard units, radiant units and forced air units as either the primary or secondary heating system.

EXCEPTION: Electric resistance systems for which the total electric heat capacity in each individual dwelling unit does not exceed the greater of: 1) One thousand watts (1000 w) per dwelling unit, or; 2) One watt per square foot (1 w/ft^2) of the gross floor area.

2. Other: All gas, wood, oil and propane space heating systems, unless electric resistance is used as a secondary heating system, and all heat pump space heating systems. (See EXCEPTIONS, Electric Resistance, section 502.2.2 above.)

502.3 Reserved.

502.4 Air Leakage:

502.4.1 General: The requirements of this section shall apply to all buildings and structures, or portions thereof, and only to those locations separating outdoor ambient conditions from interior spaces that are heated or mechanically cooled.

502.4.2 Doors and Windows, General: Exterior doors and windows shall be designed to limit air leakage into or from the building envelope. Site-constructed doors and windows shall be sealed in accordance with Section 502.4.3.

502.4.3 Seals and Weatherstripping:

a. Exterior joints around windows and door frames, openings between walls and foundation, between walls and roof and wall panels; openings at penetrations of utility services through walls, floors and roofs; and all other openings in the building envelope and all other openings in between units shall be sealed, caulked, gasketed or weatherstripped to limit air leakage. Other exterior joints and seams shall be similarly treated, or taped, or covered with moisture vapor permeable housewrap.

b. All exterior doors or doors serving as access to an enclosed unheated area shall be weatherstripped to limit leakage around their perimeter when in a closed position.

c. Site built windows are exempt from testing but shall be made tight fitting. Fixed lights shall have glass retained by stops with sealant or caulking all around. Operating sash shall have weatherstripping working against overlapping trim and a closer/latch which will hold the sash closed. The window frame to framing crack shall be made tight with caulking, overlapping membrane or other approved technique.

d. Openings that are required to be fire resistive are exempt from this section.

502.4.4 Recessed Luminaires: When installed in contact with the building envelope, recessed luminaires shall be Type IC rated and certified under ASTM E283 to have no more than 2.0 cfm air movement from the conditioned space to the ceiling cavity. The luminaire shall be tested at 75 Pascals or 1.57 lbs/ft^2 pressure difference and have a label attached, showing compliance with this test method. Recessed luminaires shall be installed with a gasket or caulk between the fixture and ceiling to prevent air leakage.

502.4.5 Building Air Leakage Testing: Building envelope air leakage control shall be considered acceptable when tested to have an air leakage is less than 0.00030 Specific Leakage Area (SLA) when tested with a blower door at a pressure of 50 Pascals (0.2 inch w.g.). Testing shall occur any time after rough in and after installation of penetrations of the building envelope, including penetrations for utilities, plumbing, electrical, ventilation, and combustion appliances and sealing thereof. When required by the building official, the test shall be conducted in the presence of department staff. The blower door test results shall be recorded on the certificate required in Section 105.4.

EXCEPTIONS: 1. Additions less than 750 square feet.
2. Once a visual inspection has confirmed the presence of a gasket (see Section 502.4), operable windows and doors manufactured by a small business shall be permitted to be sealed off at the frame prior to the test.

Specific Leakage Area (SLA) shall be calculated as follows:

SLA = (CFM50 x 0.055) / (CFA x 144)

Where:

CFM50 = Blower door fan flow at 50 Pascal pressure difference
CFA = Conditioned Floor Area of the housing unit

During testing:

1. Exterior windows and doors, fireplace and stove doors shall be closed, but not sealed;

2. Dampers shall be closed, but not sealed; including exhaust, intake, makeup air, back draft, and flue dampers;

3. Interior doors connecting conditioned spaces shall be open; access hatches to conditioned crawl spaces and conditioned attics shall be open; doors connecting to unconditioned spaces closed but not sealed;

4. Exterior openings for continuous operation ventilation systems and heat recovery ventilators shall be closed and sealed;

5. Heating and cooling system(s) shall be turned off;

6. HVAC ducts supply and return registers shall not be sealed.

[Statutory Authority: RCW 19.27A.025, 19.27A.045. 10-03-115, 10-13-113 and 10-22-056, § 51-11-0502, filed 1/20/10, 6/21/10 and 10/28/10, effective 1/1/11. Statutory Authority: RCW 19.27A.025, 19.27A.045 and chapters 19.27, 19.27A, and 34.05 RCW. 09-06-024, § 51-11-0502, filed 2/23/09, effective 7/1/10. Statutory Authority: RCW 19.27A.022, 19.27A.025, 19.27A.045, and chapters 19.27 and 34.05 RCW. 07-01-089, § 51-11-0502, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27A.025, 19.27A.045 and chapters 19.27, 19.27A, and 34.05 RCW. 05-01-013, § 51-11-0502, filed 12/2/04, effective 7/1/05. Statutory Authority: RCW 19.27A.020, 19.27A.045. 04-01-106, § 51-11-0502, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27A.025, 19.27A.045. 02-01-112, § 51-11-0502, filed 12/18/01, effective 7/1/02; 01-03-010, § 51-11-0502, filed 1/5/01, effective 7/1/01; 98-03-003, § 51-11-0502, filed 1/8/98, effective 7/1/98. Statutory Authority: Chapters 19.27 and 19.27A RCW and 1994 c 226. 95-01-126, § 51-11-0502, filed 12/21/94, effective 6/30/95. Statutory Authority: Chapters 19.27, 19.27A and 34.05 RCW. 94-05-059, § 51-11-0502, filed 2/10/94, effective 4/1/94. Statutory Authority: Chapter 19.27A RCW. 92-01-140, § 51-11-0502, filed 12/19/91, effective 7/1/92. Statutory Authority: RCW 19.27A.020 and 1990 c 2. 91-01-112, § 51-11-0502, filed 12/19/90, effective 7/1/91.]

Reviser's note: Notice of Objection: The Joint Administrative Rules Review Committee (Committee) finds that, in adopting the 2009 proposed changes to the State Energy Code, Chapter 51-11 WAC, on November 20, 2009, the State Building Code Council (Council) failed to comply with all requirements of the law and failed to adequately respond to the Committee's request for additional economic impact and cost-benefit analyses prior to adoption.

On October 1, 2009, the Committee found that the Small Business Economic Impact Statement (SBEIS) for the proposed changes filed with the Code Reviser failed to comply with all requirements of law. The Committee requested that the Council conduct a cost-benefit analysis pursuant to RCW 34.05.328 and amend the SBEIS to provide additional economic impact information, including an estimate of the number of jobs that would be created or lost as a result of compliance with all the proposed rules, as required by RCW 19.85.040 (2)(d).

The Council provided the Committee with information and data on November 18, 2009. On December 2, 2009, the Committee found that the Council failed to adequately respond to the Committee's request for additional data. Specifically, the Committee found that the Council failed to amend the SBEIS to (a) estimate the number of jobs that would be created or lost as a result of compliance with the proposed changes; and (b) support the SBEIS with a detailed and rigorous costs analysis of the cumulative impact of all the changes. In addition, the Committee found that the Council failed to provide the Committee with a cost-benefit analysis of the proposed changes and pursuant to the requirements of RCW 34.05.328.

The Committee strongly supports a process that makes thoughtful and informed progress towards changes that result in improved energy efficiency

in our buildings, wherever practicable. While the Council worked diligently, it is the opinion of the Committee that the Council did not fully develop and consider the economic impacts and costs versus benefits of these significant changes to our Energy Code. Furthermore, it is the opinion of the Committee that the Council and the Legislature need this information to fully evaluate the value, impacts, and consequences of the proposed codes, with due diligence to their respective fiduciary responsibilities, in order to create the best informed public policy.

As a result, the Committee recommends that the Governor suspend the adoption and implementation of the changes to the Energy Code, Chapter 51-11 WAC, adopted by the Council on November 20, 2009, until such time as a more adequate analysis has been completed and considered by the appropriate bodies.

For all of the above stated reasons, the Committee objects to the changes to the State Energy Code, Chapter 51-11 WAC, that were adopted by the Council on November 20, 2009, and hereby directs the Code Reviser, pursuant to RCW 34.05.640(4), to publish this Notice of Objection in the Washington State Register and along with any publication in the Washington Administrative Code of changes to Chapter 51-11 WAC that were adopted by the Council in 2009 and filed with the Code Reviser.

WAC 51-11-0503 Mechanical systems.

503.1 General: This section covers the determination of design requirements, system and component performance, control requirements, insulating systems and duct sealing. For all other duct construction requirements, refer to the State Mechanical Code (chapter 51-52 WAC).

503.2 Calculations of Heating and Cooling Loads, and System Sizing Limits: The design parameters specified in Chapter 3 shall apply for all computations.

503.2.1 Calculation Procedures: Heating and cooling design loads for the purpose of sizing HVAC systems are required and shall be calculated in accordance with accepted engineering practice, including infiltration and ventilation.

503.2.2 Space Heating and Space Cooling System Sizing Limits: Mechanical systems for all buildings which provide space heating and/or space cooling shall be sized as required in IRC Section M1401.3.

EXCEPTIONS: The following limited exemptions from the sizing limit shall be allowed; however, in all cases heating and/or cooling design load calculations shall be submitted.

1. For equipment which provides both heating and cooling in one package unit, including heat pumps with electric heating and cooling and gas-pack units with gas heating and electric cooling, compliance need only be demonstrated for the larger of the space heating or space cooling load for the selected system size.
2. Natural gas- or oil-fired space heating equipment whose total rated space heating output in any one dwelling unit is 40,000 Btu/h or less is exempt from the sizing limit.
3. Stand-by equipment may be installed if controls and other devices are provided which allow redundant equipment to operate only when the primary equipment is not operating.
4. Electric resistance heaters under 2 kW.

503.3 Simultaneous Heating and Cooling: Systems and equipment that provide simultaneous heating and cooling shall comply with the requirements in, as appropriate, Section 1422 or Section 1435.

503.4 HVAC Equipment Performance Requirements: All heating equipment shall meet the requirements of the National Appliance Energy Conservation Act (NAECA) and be so labeled. Equipment shall also comply with Section 1411.

503.5 Reserved.

503.6 Balancing: The HVAC system design shall provide a means for balancing air and water systems. Balancing the system shall include, but not be limited to, dampers, temperature and pressure test connections and balancing valves.

503.7 Cooling with Outdoor Air (Economizer Cycle): Systems and equipment that provide mechanical cooling shall comply with Section 1413 and, as appropriate, Section 1423 or 1433.

503.8 Controls:

503.8.1 Temperature Control: The primary space conditioning system within each dwelling unit shall be provided with at least one programmable thermostat for the regulation of temperature. The thermostat shall allow for, at a minimum, a 5-2 programmable schedule (weekdays/weekends) and be capable of providing at least two programmable setback periods per day.

Each additional system provided within a dwelling unit shall be provided with at least one adjustable thermostat for the regulation of temperature. The thermostat shall allow for, at a minimum, a 5-2 programmable scheduled (weekdays/weekends).

EXCEPTIONS: 1. Systems controlled by an occupant sensor that is capable of shutting the system off when no occupant is sensed for a period of up to thirty minutes.
2. Systems controlled solely by a manually operated timer capable of operating the system for no more than two hours.

Each thermostat shall be capable of being set by adjustment or selection of sensors as follows:

503.8.1.1: When used to control heating only: Fifty-five degrees to seventy-five degrees F.

503.8.1.2: When used to control cooling only: Seventy degrees to eighty-five degrees F.

503.8.1.3: When used to control both heating and cooling, it shall be capable of being set from fifty-five degrees to eighty-five degrees F and shall be capable of operating the system heating and cooling in sequence. The thermostat and/or control system shall have an adjustable deadband of not less than ten degrees F.

503.8.2 Humidity Control: If a system is equipped with a means for adding moisture to maintain specific selected relative humidities in space or zones, a humidistat shall be provided. Humidistats shall be capable of being set to prevent new energy from being used to produce space-relative humidity above thirty percent.

EXCEPTION: Special uses requiring different relative humidities may be permitted when approved by the building official.

503.8.3 Zoning for Temperature Control:

503.8.3.1 One- and Two-Family Dwellings: At least one thermostat for regulation of space temperature shall be provided for each separate system. In addition, a readily accessible manual or automatic means shall be provided to partially

restrict or shut off the heating and/or cooling input to each zone or floor.

503.8.3.2 Multifamily Dwellings: For multifamily dwellings, each individual dwelling unit shall have at least one thermostat for regulation of space temperature. A readily accessible manual or automatic means shall be provided to partially restrict or shut off the heating and/or cooling input to each room. Spaces other than living units shall meet the requirements of 503.8.3.3.

503.8.3.3 Control Setback and Shutoff:

One- and Two-Family and Individual Multifamily dwelling units—The thermostat required in section 503.8.3.1 or section 503.8.3.2, or an alternate means such as a switch or clock, shall provide a readily accessible, manual or automatic means for reducing the energy required for heating and cooling during the periods of nonuse or reduced need, such as, but not limited to unoccupied periods and sleeping hours. Lowering thermostat set points to reduce energy consumption of heating systems shall not cause energy to be expended to reach the reduced setting.

503.8.3.4 Systems Serving Multiple Dwelling Units, Guest Rooms, and Common Areas: Systems that serve more than two dwelling units, guest rooms, and common areas shall comply with the control requirements in Sections 1412 and 1432, with the exceptions of Sections 1412.4.2 and 1432.1.

503.8.3.5 Heat Pump Controls: Heat pumps with supplementary electric resistance heaters shall have controls complying with Section 503.8.1. In addition, controls shall meet the following requirements:

1. Prevent supplementary heater operation when the heating load can be met by the heat pump alone; and

2. The cut-on temperature for compression heating shall be higher than the cut-on temperature for supplementary heating, and the cut-off temperature for compressing heating shall be higher than the cut-off temperature for supplementary heating.

All heat pumps installed under this section shall include the capability to lock out the supplementary heat based on outdoor temperature. This control shall have a maximum setting of 40°F. At final inspection, the lock out control shall be set to 32°F or less.

EXCEPTION: The controls may allow supplementary heater operation during defrost.

503.9 Air Handling Duct System Insulation: Ducts, plenums and enclosures installed in or on buildings shall be thermally insulated per Table 5-11.

EXCEPTIONS: Duct insulation (except where required to prevent condensation) is not required in any of the following cases:

1. When the heat gain or loss of the ducts, without insulation, will not increase the energy requirements of the building.
2. Within the HVAC equipment.
3. Exhaust air ducts.
4. Supply or return air ducts installed in basements or cellars in one-and two-family dwellings.
5. The insulation required on supply air ducts may be reduced to R-4 when installed in buffer spaces not intended for human occupancy such as insulation crawl spaces and enclosed attic spaces. The buffer space must be air sealed and insulated to the full value of conditioned spaces.

503.10 Ducts.

503.10.1 Installation of ducts in exterior walls, floors or ceilings shall not displace required envelope insulation. Building cavities may not be used as ducts.

503.10.2 Leakage Testing: Ducts shall be leak tested in accordance with RS-33, using the maximum duct leakage rates specified in Section 503.10.3.

503.10.3 Sealing: All ducts, air handlers, filter boxes, and building cavities used as ducts shall be sealed. Joints and seams shall comply with Section M1601.3 of the International Residential Code or Section 603.9 of the International Mechanical Code. Duct tightness testing shall be conducted to verify that the ducts are sealed. A signed affidavit documenting the test results shall be provided to the jurisdiction having authority by the testing agent. When required by the building official, the test shall be conducted in the presence of department staff. Duct tightness shall be verified by either of the following:

1. Postconstruction test: Leakage to outdoors shall be less than or equal to 6 cfm per 100 ft^2 of conditioned floor area or a total leakage less than or equal to 8 cfm per 100 ft^2 of conditioned floor area when tested at a pressure differential of 0.1 inches w.g. (25 Pa) across the entire system, including the manufacturer's air handler enclosure. All register boots shall be taped or otherwise sealed during the test.

2. Rough-in test: Total leakage shall be less than or equal to 6 cfm per 100 ft^2 of conditioned floor area when tested at a pressure differential of 0.1 inches w.g. (25 Pa) across the roughed-in system, including the manufacturer's air handler enclosure. All register boots shall be taped or otherwise sealed during the test. If the air handler is not installed at the time of the test, total leakage shall be less than or equal to 4 cfm per 100 ft^2 of conditioned floor area.

EXCEPTIONS: 1. Duct tightness test is not required if the air handler and all ducts are located within conditioned space.
2. Duct tightness test is not required if the furnace is a nondirect vent type combustion appliance installed in an unconditioned space. A maximum of six feet of connected ductwork in the unconditioned space is allowed. All additional supply and return ducts shall be within the conditioned space. Ducts outside the conditioned space shall be sealed with a mastic type duct sealant and insulated on the exterior with R-8 insulation for above grade ducts and R-5 water resistant insulation when within a slab or earth.

503.10.4 Dampers: Requirements for Automatic or manual dampers are found in Chapter 15 of the Washington State Residential Code (chapter 51-51 WAC).

503.11 Pipe Insulation: All piping shall be thermally insulated in accordance with Table 5-12.

EXCEPTION: Piping installed within unitary HVAC equipment.

Cold water pipes outside the conditioned space shall be insulated in accordance with the Washington State Plumbing Code (chapter 51-56 WAC).

[Statutory Authority: RCW 19.27A.025, 19.27A.045. 10-03-115, 10-13-113 and 10-22-056, § 51-11-0503, filed 1/20/10, 6/21/10 and 10/28/10, effective 1/1/11. Statutory Authority: RCW 19.27A.025, 19.27A.045 and chapters 19.27, 19.27A, and 34.05 RCW. 09-06-024, § 51-11-0503, filed 2/23/09, effective 7/1/10. Statutory Authority: RCW 19.27A.022, 19.27A.025, 19.27A.045, and chapters 19.27 and 34.05 RCW. 07-01-089, § 51-11-0503, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27A.020, 19.27A.045. 04-01-106, § 51-11-0503, filed 12/17/03, effective 7/1/04; 02-24-076, § 51-11-0503, filed 12/4/02, effective 5/1/03. Statutory Authority: RCW 19.27A.025, 19.27A.045. 02-01-112, § 51-11-0503, filed 12/18/01, effective 7/1/02; 01-03-010, § 51-11-0503, filed 1/5/01, effective 7/1/01. Statutory Authority: RCW 19.27A.020, 19.27A.045, and 19.27.020. 98-24-075, § 51-11-0503, filed 12/1/98, effective 7/1/99. Statutory Authority: RCW 19.27A.025 and 19.27A.045. 98-03-003, § 51-11-0503, filed 1/8/98, effective 7/1/98. Statutory Authority: RCW 19.27A.025. 93-21-052, § 51-11-0503, filed 10/18/93, effective 4/1/94. Statutory Authority: Chapter 19.27A RCW. 92-01-140, § 51-11-0503, filed 12/19/91, effective 7/1/92. Statutory Authority: RCW 19.27A.020 and 1990 c 2. 91-01-112, § 51-11-0503, filed 12/19/90, effective 7/1/91.]

Reviser's note: Notice of Objection: The Joint Administrative Rules Review Committee (Committee) finds that, in adopting the 2009 proposed changes to the State Energy Code, Chapter 51-11 WAC, on November 20, 2009, the State Building Code Council (Council) failed to comply with all requirements of the law and failed to adequately respond to the Committee's request for additional economic impact and cost-benefit analyses prior to adoption.

On October 1, 2009, the Committee found that the Small Business Economic Impact Statement (SBEIS) for the proposed changes filed with the Code Reviser failed to comply with all requirements of law. The Committee requested that the Council conduct a cost-benefit analysis pursuant to RCW 34.05.328 and amend the SBEIS to provide additional economic impact information, including an estimate of the number of jobs that would be created or lost as a result of compliance with all the proposed rules, as required by RCW 19.85.040 (2)(d).

The Council provided the Committee with information and data on November 18, 2009. On December 2, 2009, the Committee found that the Council failed to adequately respond to the Committee's request for additional data. Specifically, the Committee found that the Council failed to amend the SBEIS to (a) estimate the number of jobs that would be created or lost as a result of compliance with the proposed changes; and (b) support the SBEIS with a detailed and rigorous costs analysis of the cumulative impact of all the changes. In addition, the Committee found that the Council failed to provide the Committee with a cost-benefit analysis of the proposed changes and pursuant to the requirements of RCW 34.05.328.

The Committee strongly supports a process that makes thoughtful and informed progress towards changes that result in improved energy efficiency in our buildings, wherever practicable. While the Council worked diligently, it is the opinion of the Committee that the Council did not fully develop and consider the economic impacts and costs versus benefits of these significant changes to our Energy Code. Furthermore, it is the opinion of the Committee that the Council and the Legislature need this information to fully evaluate the value, impacts, and consequences of the proposed codes, with due diligence to their respective fiduciary responsibilities, in order to create the best informed public policy.

As a result, the Committee recommends that the Governor suspend the adoption and implementation of the changes to the Energy Code, Chapter 51-11 WAC, adopted by the Council on November 20, 2009, until such time as a more adequate analysis has been completed and considered by the appropriate bodies.

For all of the above stated reasons, the Committee objects to the changes to the State Energy Code, Chapter 51-11 WAC, that were adopted by the Council on November 20, 2009, and hereby directs the Code Reviser, pursuant to RCW 34.05.640(4), to publish this Notice of Objection in the Washington State Register and along with any publication in the Washington Administrative Code of changes to Chapter 51-11 WAC that were adopted by the Council in 2009 and filed with the Code Reviser.

WAC 51-11-0504 Domestic water systems.

504.1 Scope: The purpose of this section is to provide criteria for design and equipment selection that will produce energy savings when applied to domestic water systems.

504.2 Water Heaters, Storage Tanks and Boilers:

504.2.1 Performance Efficiency: Domestic water heating equipment shall comply with the applicable efficiencies in Tables 14-1A through 14-1G. All electric water heaters in unheated spaces or on concrete floors shall be placed on an incompressible, insulated surface with a minimum thermal resistance of R-10.

For combination space and service water heaters with a principal function of providing space heat, the Combined Annual Efficiency (CAE) may be calculated by using ASHRAE Standard 124-1991. Storage water heaters used in combination space heat and water heat applications shall have either an Energy Factor (EF) or a Combined Annual Efficiency (CAE) of not less than the following:

	Energy Factor (EF)	Combined Annual Efficiency (CAE)
<50 gallon storage	0.58	0.71
50 to 70 gallon storage	0.57	0.71
>70 gallon storage	0.55	0.70

504.2.2 Insulation: Heat loss from unfired hot-water storage tanks shall be limited to a maximum of 9.6 Btu/hr/ft^2 of external tank surface area. The design ambient temperature shall be no higher than sixty-five degrees F.

504.2.3 Combination Service Water Heating/Space Heating Boilers: Service water heating equipment shall not be dependent on year round operation of space heating boilers.

EXCEPTIONS:

1. Systems with service/space heating boilers having a standby loss Btu/h less than:

$$(13.3 \text{ pmd} + 400)/n$$

determined by the fixture count method where:

pmd = probably maximum demand in gallons/hour as determined in accordance with Chapter 49 of Standard RS-11.

n = fraction of year when outdoor daily mean temperature exceeds 64.9° F.

The standby loss is to be determined for a test period of twenty-four-hour duration while maintaining a boiler water temperature of ninety degrees F above an ambient of sixty degrees F and a five foot stack on appliance.

2. For systems where the use of a single heating unit will lead to energy savings, such unit shall be utilized.

504.3 Automatic Controls: Service water heating systems shall be equipped with automatic temperature controls capable of adjustment from the lowest to the highest acceptable temperature settings for the intended use. Temperature setting range shall be set to one hundred twenty degrees F or forty-nine degrees C.

504.4 Shutdown: A separate switch shall be provided to permit turning off the energy supplied to electric service water heating systems. A separate valve shall be provided to permit turning off the energy supplied to the main burner(s) of all other types of service water heater systems.

504.5 Swimming Pools:

504.5.1 Controls: All pool heaters shall be equipped with readily accessible ON/OFF switch to allow shutting off the operation of the heater without adjusting the thermostat setting. Controls shall be provided to allow the water temperature to be regulated from the maximum design temperature down to sixty-five degrees F.

504.5.2 Residential Pool Pumps:

504.5.2.1 Motor Efficiency: Pool pump motors may not be split-phase or capacitor start-induction run type.

504.5.2.2 Two-Speed Capability:

1. Pump motors: Pool pump motors with a capacity of 1 hp or more shall have the capability of operating at two or more speeds with low speed having a rotation rate that is no more than one-half of the motor's maximum rotation rate.

2. Pump controls: Pool pump motor controls shall have the capability of operating the pool pump with at least two speeds. The default circulation speed shall be the lowest speed, with a high speed override capability being for a temporary period not to exceed one normal cycle.

504.5.2.3 Portable Electric Spas: The standby power of portable electric spas shall not be greater than 5(V2/3) watts where V = the total volume, in gallons.

504.5.3 Pool Covers: Heated swimming pools shall be equipped with a pool cover, approved by the building official.

504.6 Pump Operation: Circulating water systems shall be controlled so that the circulation pump(s) can be conveniently turned off, automatically or manually, when the water system is not in operation.

504.7 Pipe Insulation: Piping shall be thermally insulated in accordance with section 503.11.

504.8 Conservation of Water:

504.8.1 Showers and Lavatories: Showers and lavatories used for other than safety reasons shall be equipped with flow control devices or specially manufactured showerheads or aerators to limit the total water flow rate as set forth in chapter 51-56 WAC, as measured with both hot and cold faucets turned on to their maximum flow.

[Statutory Authority: RCW 19.27A.025, 19.27A.045. 10-03-115, 10-13-113 and 10-22-056, § 51-11-0504, filed 1/20/10, 6/21/10 and 10/28/10, effective 1/1/11. Statutory Authority: RCW 19.27A.022, 19.27A.025, 19.27A.045, and chapters 19.27 and 34.05 RCW. 07-01-089, § 51-11-0504, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27A.020, 19.27A.045. 04-01-106, § 51-11-0504, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27A.025, 19.27A.045. 01-03-010, § 51-11-0504, filed 1/5/01, effective 7/1/01; 98-03-003, § 51-11-0504, filed 1/8/98, effective 7/1/98. Statutory Authority: Chapter 19.27A RCW. 92-01-140, § 51-11-0504, filed 12/19/91, effective 7/1/92. Statutory Authority: RCW 19.27A.020 and 1990 c 2. 91-01-112, § 51-11-0504, filed 12/19/90, effective 7/1/91.]

Reviser's note: Notice of Objection: The Joint Administrative Rules Review Committee (Committee) finds that, in adopting the 2009 proposed changes to the State Energy Code, Chapter 51-11 WAC, on November 20, 2009, the State Building Code Council (Council) failed to comply with all requirements of the law and failed to adequately respond to the Committee's request for additional economic impact and cost-benefit analyses prior to adoption.

On October 1, 2009, the Committee found that the Small Business Economic Impact Statement (SBEIS) for the proposed changes filed with the Code Reviser failed to comply with all requirements of law. The Committee requested that the Council conduct a cost-benefit analysis pursuant to RCW 34.05.328 and amend the SBEIS to provide additional economic impact information, including an estimate of the number of jobs that would be created or lost as a result of compliance with all the proposed rules, as required by RCW 19.85.040 (2)(d).

The Council provided the Committee with information and data on November 18, 2009. On December 2, 2009, the Committee found that the Council failed to adequately respond to the Committee's request for additional data. Specifically, the Committee found that the Council failed to amend the SBEIS to (a) estimate the number of jobs that would be created or lost as a result of compliance with the proposed changes; and (b) support the SBEIS with a detailed and rigorous costs analysis of the cumulative impact of all the changes. In addition, the Committee found that the Council failed to provide the Committee with a cost-benefit analysis of the proposed changes and pursuant to the requirements of RCW 34.05.328.

The Committee strongly supports a process that makes thoughtful and informed progress towards changes that result in improved energy efficiency in our buildings, wherever practicable. While the Council worked diligently, it is the opinion of the Committee that the Council did not fully develop and consider the economic impacts and costs versus benefits of these significant changes to our Energy Code. Furthermore, it is the opinion of the Committee that the Council and the Legislature need this information to fully evaluate the value, impacts, and consequences of the proposed codes, with due diligence to their respective fiduciary responsibilities, in order to create the best informed public policy.

As a result, the Committee recommends that the Governor suspend the adoption and implementation of the changes to the Energy Code, Chapter 51-11 WAC, adopted by the Council on November 20, 2009, until such time as a more adequate analysis has been completed and considered by the appropriate bodies.

For all of the above stated reasons, the Committee objects to the changes to the State Energy Code, Chapter 51-11 WAC, that were adopted by the Council on November 20, 2009, and hereby directs the Code Reviser, pursuant to RCW 34.05.640(4), to publish this Notice of Objection in the Washington State Register and along with any publication in the Washington Administrative Code of changes to Chapter 51-11 WAC that were adopted by the Council in 2009 and filed with the Code Reviser.

WAC 51-11-0505 Lighting.

505.1 **Interior Lighting:** A minimum of 50 percent of all luminaires shall be high efficacy luminaires.

EXCEPTION: Lighting that complies with the Prescriptive Lighting Option in Section 1520 or the Lighting Power Allowance Option in Section 1530.

505.2 **Exterior Lighting:** Luminaires providing outdoor lighting and permanently mounted to a residential building or to other buildings on the same lot shall be high efficacy luminaires.

EXCEPTIONS: 1. Permanently installed outdoor luminaires that are not high efficacy shall be allowed provided they are controlled by a motion sensor(s) with integral photocontrol photosensor.
2. Permanently installed luminaires in or around swimming pools, water features.

505.3 **Linear Fluorescent Fixtures:** Linear fluorescent fixtures must be fitted with T-8 or smaller lamps (but not T-10 or T-12 lamps).

[Statutory Authority: RCW 19.27A.025, 19.27A.045. 10-03-115, 10-13-113 and 10-22-056 § 51-11-0505, filed 1/20/10, 6/21/10 and 10/28/10, effective 1/1/11. Statutory Authority: RCW 19.27A.022, 19.27A.025, 19.27A.045, and chapters 19.27 and 34.05 RCW. 07-01-089, § 51-11-0505, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27A.020, 19.27A.045. 04-01-106, § 51-11-0505, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27A.025, 19.27A.045. 01-03-010, § 51-11-0505, filed 1/5/01, effective 7/1/01. Statutory Authority: RCW 19.27A.025. 93-21-052, § 51-11-0505, filed 10/18/93, effective 4/1/94. Statutory Authority: Chapter 19.27A RCW. 92-01-140, § 51-11-0505, filed 12/19/91, effective

7/1/92. Statutory Authority: RCW 19.27A.020 and 1990 c 2. 91-01-112, § 51-11-0505, filed 12/19/90, effective 7/1/91.]

Reviser's note: Notice of Objection: The Joint Administrative Rules Review Committee (Committee) finds that, in adopting the 2009 proposed changes to the State Energy Code, Chapter 51-11 WAC, on November 20, 2009, the State Building Code Council (Council) failed to comply with all requirements of the law and failed to adequately respond to the Committee's request for additional economic impact and cost-benefit analyses prior to adoption.

On October 1, 2009, the Committee found that the Small Business Economic Impact Statement (SBEIS) for the proposed changes filed with the Code Reviser failed to comply with all requirements of law. The Committee requested that the Council conduct a cost-benefit analysis pursuant to RCW 34.05.328 and amend the SBEIS to provide additional economic impact information, including an estimate of the number of jobs that would be created or lost as a result of compliance with all the proposed rules, as required by RCW 19.85.040 (2)(d).

The Council provided the Committee with information and data on November 18, 2009. On December 2, 2009, the Committee found that the Council failed to adequately respond to the Committee's request for additional data. Specifically, the Committee found that the Council failed to amend the SBEIS to (a) estimate the number of jobs that would be created or lost as a result of compliance with the proposed changes; and (b) support the SBEIS with a detailed and rigorous costs analysis of the cumulative impact of all the changes. In addition, the Committee found that the Council failed to provide the Committee with a cost-benefit analysis of the proposed changes and pursuant to the requirements of RCW 34.05.328.

The Committee strongly supports a process that makes thoughtful and informed progress towards changes that result in improved energy efficiency in our buildings, wherever practicable. While the Council worked diligently, it is the opinion of the Committee that the Council did not fully develop and consider the economic impacts and costs versus benefits of these significant changes to our Energy Code. Furthermore, it is the opinion of the Committee that the Council and the Legislature need this information to fully evaluate the value, impacts, and consequences of the proposed codes, with due diligence to their respective fiduciary responsibilities, in order to create the best informed public policy.

As a result, the Committee recommends that the Governor suspend the adoption and implementation of the changes to the Energy Code, Chapter 51-11 WAC, adopted by the Council on November 20, 2009, until such time as a more adequate analysis has been completed and considered by the appropriate bodies.

For all of the above stated reasons, the Committee objects to the changes to the State Energy Code, Chapter 51-11 WAC, that were adopted by the Council on November 20, 2009, and hereby directs the Code Reviser, pursuant to RCW 34.05.640(4), to publish this Notice of Objection in the Washington State Register and along with any publication in the Washington Administrative Code of changes to Chapter 51-11 WAC that were adopted by the Council in 2009 and filed with the Code Reviser.

WAC 51-11-0525 Equation 1—Single-family residential.

EQUATION 1—SINGLE-FAMILY RESIDENTIAL
TARGET UA

$$UA_T = U_W A_W + U_{BGW} A_{BGW} + U_{VG} A_{VG} + U_{OG} A_{OG} + U_F A_F + U_{RC} A_{RC} + U_D A_D + F_S P_S$$

Where:

UA_T	=	the target combined thermal transmittance of the gross exterior wall, floor and roof/ceiling assembly area.
U_W	=	the thermal transmittance value of the opaque above grade wall area found in Table 5-1.
A_W	=	opaque above grade wall area.
U_{BGW}	=	the thermal transmittance value of the below grade opaque wall area found in Table 5-1.
A_{BGW}	=	opaque below grade wall area.
U_{VG}	=	the thermal transmittance value of the vertical glazing area found in Table 5-1.
A_{VG}	=	15% of the total floor area of the conditioned space minus A_{OG}.
U_{OG}	=	the thermal transmittance value of the overhead glazing area found in Table 5-1.
A_{OG}	=	overhead glazing area (if the proposed A_{OG} exceeds 15 percent, the target A_{OG} shall be 15 percent of the total floor area of the conditioned space).
U_F	=	the thermal transmittance value of the floor area found in Table 5-1.
A_F	=	floor area over unconditioned space.
U_{RC}	=	the thermal transmittance value of the roof/ceiling area found in Table 5-1.
A_{RC}	=	roof/ceiling area.
U_D	=	the thermal transmittance value of the opaque door area found in Table 5-1.
A_D	=	opaque door area.
F_S	=	concrete slab component F-factor found in Table 5-1.
P_S	=	lineal ft. of concrete slab perimeter.

[Statutory Authority: RCW 19.27A.025, 19.27A.045. 10-03-115, 10-13-113 and 10-22-056, § 51-11-0525, filed 1/20/10, 6/21/10 and 10/28/10, effective 1/1/11. Statutory Authority: RCW 19.27A.022, 19.27A.025, 19.27A.045, and chapters 19.27 and 34.05 RCW. 07-01-089, § 51-11-0525, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27A.025 and 19.27A.045. 98-03-003, § 51-11-0525, filed 1/8/98, effective 7/1/98. Statutory Authority: Chapters 19.27, 19.27A and 34.05 RCW. 94-05-059, § 51-11-0525, filed 2/10/94, effective 4/1/94. Statutory Authority: Chapter 19.27A RCW. 92-01-140, § 51-11-0525, filed 12/19/91, effective 7/1/92.]

Reviser's note: Notice of Objection: The Joint Administrative Rules Review Committee (Committee) finds that, in adopting the 2009 proposed changes to the State Energy Code, Chapter 51-11 WAC, on November 20, 2009, the State Building Code Council (Council) failed to comply with all requirements of the law and failed to adequately respond to the Committee's request for additional economic impact and cost-benefit analyses prior to adoption.

On October 1, 2009, the Committee found that the Small Business Economic Impact Statement (SBEIS) for the proposed changes filed with the Code Reviser failed to comply with all requirements of law. The Committee requested that the Council conduct a cost-benefit analysis pursuant to RCW 34.05.328 and amend the SBEIS to provide additional economic impact information, including an estimate of the number of jobs that would be created or lost as a result of compliance with all the proposed rules, as required by RCW 19.85.040 (2)(d).

The Council provided the Committee with information and data on November 18, 2009. On December 2, 2009, the Committee found that the Council failed to adequately respond to the Committee's request for additional data. Specifically, the Committee found that the Council failed to amend the SBEIS to (a) estimate the number of jobs that would be created or lost as a result of compliance with the proposed changes; and (b) support the SBEIS with a detailed and

rigorous costs analysis of the cumulative impact of all the changes. In addition, the Committee found that the Council failed to provide the Committee with a cost-benefit analysis of the proposed changes and pursuant to the requirements of RCW 34.05.328.

The Committee strongly supports a process that makes thoughtful and informed progress towards changes that result in improved energy efficiency in our buildings, wherever practicable. While the Council worked diligently, it is the opinion of the Committee that the Council did not fully develop and consider the economic impacts and costs versus benefits of these significant changes to our Energy Code. Furthermore, it is the opinion of the Committee that the Council and the Legislature need this information to fully evaluate the value, impacts, and consequences of the proposed codes, with due diligence to their respective fiduciary responsibilities, in order to create the best informed public policy.

As a result, the Committee recommends that the Governor suspend the adoption and implementation of the changes to the Energy Code, Chapter 51-11 WAC, adopted by the Council on November 20, 2009, until such time as a more adequate analysis has been completed and considered by the appropriate bodies.

For all of the above stated reasons, the Committee objects to the changes to the State Energy Code, Chapter 51-11 WAC, that were adopted by the Council on November 20, 2009, and hereby directs the Code Reviser, pursuant to RCW 34.05.640(4), to publish this Notice of Objection in the Washington State Register and along with any publication in the Washington Administrative Code of changes to Chapter 51-11 WAC that were adopted by the Council in 2009 and filed with the Code Reviser.

WAC 51-11-0527 Equation 3—Single-family residential.

EQUATION 3 — SINGLE-FAMILY RESIDENTIAL
PROPOSED UA

$$UA = U_W A_W + U_{BGW} A_{BGW} + U_{VG} A_{VG} + U_{OG} A_{OG} + U_F A_F + U_{RC} A_{RC} + U_D A_D + F_S P_S$$

Where:

UA	=	the combined thermal transmittance of the gross exterior wall, floor and roof/ceiling assembly area.
U_W	=	the thermal transmittance of the opaque wall area.
A_W	=	opaque wall area.
U_{BGW}	=	the thermal transmittance value of the below grade opaque wall area.
A_{BGW}	=	opaque below grade wall area.
U_{VG}	=	the thermal transmittance value of the vertical glazing area.
A_{VG}	=	vertical glazing area, including windows in exterior doors.
U_{OG}	=	the thermal transmittance value of the overhead glazing area.
A_{OG}	=	overhead glazing area.
U_F	=	the thermal transmittance of the floor area.
A_F	=	floor area over unconditioned space.
U_{RC}	=	the thermal transmittance of the roof/ceiling area.
A_{RC}	=	roof/ceiling area.
U_D	=	the thermal transmittance value of the opaque door area.
A_D	=	opaque door area.
F_S	=	concrete slab component F-factor.
P_S	=	lineal ft. of concrete slab perimeter.

NOTE: Where more than one type of wall, window, roof/ceiling, door and skylight is used, the U and A terms for those items shall be expanded into sub-elements as:

$$U_{W1}A_{W1} + U_{W2}A_{W2} + U_{W3}A_{W3} + \ldots \text{ etc.}$$

[Statutory Authority: RCW 19.27A.025, 19.27A.045. 10-03-115, 10-13-113 and 10-22-056, § 51-11-0527, filed 1/20/10, 6/21/10 and 10/28/10, effective 1/1/11; 98-03-003, § 51-11-0527, filed 1/8/98, effective 7/1/98. Statutory Authority: Chapters 19.27, 19.27A and 34.05 RCW. 94-05-059, § 51-11-0527, filed 2/10/94, effective 4/1/94. Statutory Authority: Chapter 19.27A RCW. 92-01-140, § 51-11-0527, filed 12/19/91, effective 7/1/92.]

Reviser's note: Notice of Objection: The Joint Administrative Rules Review Committee (Committee) finds that, in adopting the 2009 proposed changes to the State Energy Code, Chapter 51-11 WAC, on November 20, 2009, the State Building Code Council (Council) failed to comply with all requirements of the law and failed to adequately respond to the Committee's request for additional economic impact and cost-benefit analyses prior to adoption.

On October 1, 2009, the Committee found that the Small Business Economic Impact Statement (SBEIS) for the proposed changes filed with the Code Reviser failed to comply with all requirements of law. The Committee requested that the Council conduct a cost-benefit analysis pursuant to RCW 34.05.328 and amend the SBEIS to provide additional economic impact information, including an estimate of the number of jobs that would be created or lost as a result of compliance with all the proposed rules, as required by RCW 19.85.040 (2)(d).

The Council provided the Committee with information and data on November 18, 2009. On December 2, 2009, the Committee found that the Council failed to adequately respond to the Committee's request for additional data. Specifically, the Committee found that the Council failed to amend the SBEIS to (a) estimate the number of jobs that would be created or lost as a result of compliance with the proposed changes; and (b) support the SBEIS with a detailed and rigorous costs analysis of the cumulative impact of all the changes. In addition, the Committee found that the Council failed to provide the Committee with a cost-benefit analysis of the proposed changes and pursuant to the requirements of RCW 34.05.328.

The Committee strongly supports a process that makes thoughtful and informed progress towards changes that result in improved energy efficiency in our buildings, wherever practicable. While the Council worked diligently, it is the opinion of the Committee that the Council did not fully develop and consider the economic impacts and costs versus benefits of these significant changes to our Energy Code. Furthermore, it is the opinion of the Committee that the Council and the Legislature need this information to fully evaluate the value, impacts, and consequences of the proposed codes, with due diligence to their respective fiduciary responsibilities, in order to create the best informed public policy.

As a result, the Committee recommends that the Governor suspend the adoption and implementation of the changes to the Energy Code, Chapter 51-11 WAC, adopted by the Council on November 20, 2009, until such time as a more adequate analysis has been completed and considered by the appropriate bodies.

For all of the above stated reasons, the Committee objects to the changes to the State Energy Code, Chapter 51-11 WAC, that were adopted by the Council on November 20, 2009, and hereby directs the Code Reviser, pursuant to RCW 34.05.640(4), to publish this Notice of Objection in the Washington State Register and along with any publication in the Washington Administrative Code of changes to Chapter 51-11 WAC that were adopted by the Council in 2009 and filed with the Code Reviser.

WAC 51-11-0530 Table 5-1.

TABLE 5-1
TARGET COMPONENT VALUES FOR SINGLE-FAMILY RESIDENTIAL

	Climate Zone	
Component	1	2
Glazing % Floor Area	15%	15%
Vertical Glazing U-Factor	U = 0.30	U = 0.30
Overhead Glazing U-Factor	U = 0.50	U = 0.50
Doors	U = 0.200	U = 0.200
Ceilings	U = 0.027	U = 0.027
Walls	U = 0.056	U = 0.056
Floors	U = 0.029	U = 0.029
Slab on Grade	F = 0.36	F = 0.36
Below Grade		
Wall R-Value	R-21	R-21
2' Depth: Walls	U = 0.042	U = 0.042
Slab	F = 0.59	F = 0.59
3.5' Depth: Walls	U = 0.041	U = 0.041
Slab	F = 0.64	F = 0.64
7' Depth: Walls	U = 0.037	U = 0.037
Slab	F = 0.57	F = 0.57

Log and Solid Timber walls that have a minimum average thickness of 3.5" in spaces with space heating by "other fuels" are exempt from wall target UA and proposed UA calculations.

[Statutory Authority: RCW 19.27A.025, 19.27A.045. 10-03-115, 10-13-113 and 10-22-056, § 51-11-0530, filed 1/20/10, 6/21/10 and 10/28/10, effective 1/1/11. Statutory Authority: RCW 19.27A.022, 19.27A.025, 19.27A.045, and chapters 19.27 and 34.05 RCW. 07-01-089, § 51-11-0530, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27A.025, 19.27A.045. 02-01-112, § 51-11-0530, filed 12/18/01, effective 7/1/02; 01-03-010, § 51-11-0530, filed 1/5/01, effective 7/1/01; 98-03-003, § 51-11-0530, filed 1/8/98, effective 7/1/98. Statutory Authority: Chapters 19.27 and 19.27A RCW and 1994 c 226. 95-01-126, § 51-11-0530, filed 12/21/94, effective 6/30/95. Statutory Authority: Chapter 19.27A RCW. 92-01-140, § 51-11-0530, filed 12/19/91, effective 7/1/92.]

Reviser's note: Notice of Objection: The Joint Administrative Rules Review Committee (Committee) finds that, in adopting the 2009 proposed changes to the State Energy Code, Chapter 51-11 WAC, on November 20, 2009, the State Building Code Council (Council) failed to comply with all requirements of the law and failed to adequately respond to the Committee's request for additional economic impact and cost-benefit analyses prior to adoption.

On October 1, 2009, the Committee found that the Small Business Economic Impact Statement (SBEIS) for the proposed changes filed with the Code Reviser failed to comply with all requirements of law. The Committee requested that the Council conduct a cost-benefit analysis pursuant to RCW 34.05.328 and amend the SBEIS to provide additional economic impact information, including an estimate of the number of jobs that would be created or lost as a result of compliance with all the proposed rules, as required by RCW 19.85.040 (2)(d).

The Council provided the Committee with information and data on November 18, 2009. On December 2, 2009, the Committee found that the Council failed to adequately respond to the Committee's request for additional data. Specifically, the Committee found that the Council failed to amend the SBEIS to (a) estimate the number of jobs that would be created or lost as a result of compliance with the proposed changes; and (b) support the SBEIS with a detailed and rigorous costs analysis of the cumulative impact of all the changes. In addition, the Committee found that the Council failed to provide the Committee with a cost-benefit analysis of the proposed changes and pursuant to the requirements of RCW 34.05.328.

The Committee strongly supports a process that makes thoughtful and informed progress towards changes that result in improved energy efficiency in our buildings, wherever practicable. While the Council worked diligently, it is the opinion of the Committee that the Council did not fully develop and consider the economic impacts and costs versus benefits of these significant changes to our Energy Code. Furthermore, it is the opinion of the Committee that the Council and the Legislature need this information to fully evaluate the value, impacts, and consequences of the proposed codes, with due diligence to their respective fiduciary responsibilities, in order to create the best informed public policy.

As a result, the Committee recommends that the Governor suspend the adoption and implementation of the changes to the Energy Code, Chapter 51-11 WAC, adopted by the Council on November 20, 2009, until such time as a more adequate analysis has been completed and considered by the appropriate bodies.

For all of the above stated reasons, the Committee objects to the changes to the State Energy Code, Chapter 51-11 WAC, that were adopted by the Council on November 20, 2009, and hereby directs the Code Reviser, pursuant to RCW 34.05.640(4), to publish this Notice of Objection in the Washington State Register and along with any publication in the Washington Administrative Code of changes to Chapter 51-11 WAC that were adopted by the Council in 2009 and filed with the Code Reviser.

WAC 51-11-0540 Table 5-11.

TABLE 5-11
INSULATION OF DUCTS

DUCT LOCATION	CLIMATE ZONE	SINGLE-FAMILY RESIDENTIAL HEATING OR COOLING DUCTS
On roof or on exterior of building	I	E and W
	II	D and W
Attic, garage, crawl space, in walls[1], in floor/ceiling[1]	I	E
	II	E
Within the conditioned space or in heated basement		None Required
In cement slab or in ground		B

Note: Where ducts are used for both heating and cooling, the minimum insulation shall be as required for the most restrictive condition.

[1] Insulation may be omitted on that portion of a duct which is located within a wall or floor-ceiling space where both sides of this space are exposed to conditioned air and where this space is not ventilated or otherwise exposed to unconditioned air.

INSULATION TYPES: Minimum densities and out-of-package thickness.

A. 0.5-inch 1.5 to 2 lb/cu. ft. duct liner, mineral or glass fiber blanket or equivalent to provide an installed total thermal resistance of at least R-2.

B. 2-inch 0.60 lb/cu. ft. mineral or glass fiber blanket 1.5-inch 1.5 to 2 lb/cu. ft. duct liner, mineral or glass fiber blanket. 1.5-inch 3 to 7 lb/cu. ft. mineral or glass fiber board or equivalent to provide an installed total thermal resistance of at least R-5.

C. 3-inch 0.60 lb/cu. ft. mineral or glass fiber blanket 2-inch 1.5 to 2 lb/cu. ft. duct liner, mineral or glass fiber blanket. 2-inch 3 to 7 lb/cu. ft. mineral or glass fiber board or equivalent to provide an installed total thermal resistance of at least R-7.

D. 4-inch 0.60 lb/cu. ft. mineral or glass fiber blanket 3-inch 1.5 to 2 lb/cu. ft. duct liner, mineral or glass fiber blanket. 3-inch 3 to 7 lb/cu. ft. mineral or glass fiber board or equivalent to provide an installed total thermal resistance of at least R-10.

E. 3.5 inch 0.60 lb/cu. ft. mineral or glass fiber blanket, 2.5 inch 1.5 to 2 lb/cu. ft. duct liner, mineral or glass fiberboard or equivalent to provide an installed total thermal resistance of at least R-8.

W. Approved weatherproof barrier.

[Statutory Authority: RCW 19.27A.025, 19.27A.045. 10-03-115, 10-13-113 and 10-22-056, § 51-11-0540, filed 1/20/10, 6/21/10 and 10/28/10, effective 1/1/11. Statutory Authority: RCW 19.27A.022, 19.27A.025, 19.27A.045, and chapters 19.27 and 34.05 RCW. 07-01-089, § 51-11-0540, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27A.025. 93-21-052, § 51-11-0540, filed 10/18/93, effective 4/1/94. Statutory Authority: Chapter 19.27A RCW. 92-01-140, § 51-11-0540, filed 12/19/91, effective 7/1/92.]

Reviser's note: Notice of Objection: The Joint Administrative Rules Review Committee (Committee) finds that, in adopting the 2009 proposed changes to the State Energy Code, Chapter 51-11 WAC, on November 20, 2009, the State Building Code Council (Council) failed to comply with all requirements of the law and failed to adequately respond to the Committee's request for additional economic impact and cost-benefit analyses prior to adoption.

On October 1, 2009, the Committee found that the Small Business Economic Impact Statement (SBEIS) for the proposed changes filed with the Code Reviser failed to comply with all requirements of law. The Committee requested that the Council conduct a cost-benefit analysis pursuant to RCW 34.05.328 and amend the SBEIS to provide additional economic impact information, including an estimate of the number of jobs that would be created or lost as a result of compliance with all the proposed rules, as required by RCW 19.85.040 (2)(d).

The Council provided the Committee with information and data on November 18, 2009. On December 2, 2009, the Committee found that the Council failed to adequately respond to the Committee's request for additional data. Specifically, the Committee found that the Council failed to amend the SBEIS to (a) estimate the number of jobs that would be created or lost as a result of compliance with the proposed changes; and (b) support the SBEIS with a detailed and rigorous costs analysis of the cumulative impact of all the changes. In addition, the Committee found that the Council failed to provide the Committee with a cost-benefit analysis of the proposed changes and pursuant to the requirements of RCW 34.05.328.

The Committee strongly supports a process that makes thoughtful and informed progress towards changes that result in improved energy efficiency in our buildings, wherever practicable. While the Council worked diligently, it is the opinion of the Committee that the Council did not fully develop and consider the economic impacts and costs versus benefits of these significant changes to our Energy Code. Furthermore, it is the opinion of the Committee that the Council and the Legislature need this information to fully evaluate the value, impacts, and consequences of the proposed codes, with due diligence to their respective fiduciary responsibilities, in order to create the best informed public policy.

As a result, the Committee recommends that the Governor suspend the adoption and implementation of the changes to the Energy Code, Chapter 51-11 WAC, adopted by the Council on November 20, 2009, until such time as a more adequate analysis has been completed and considered by the appropriate bodies.

For all of the above stated reasons, the Committee objects to the changes to the State Energy Code, Chapter 51-11 WAC, that were adopted by the Council on November 20, 2009, and hereby directs the Code Reviser, pursuant to RCW 34.05.640(4), to publish this Notice of Objection in the Washington State Register and along with any publication in the Washington Administrative Code of changes to Chapter 51-11 WAC that were adopted by the Council in 2009 and filed with the Code Reviser.

WAC 51-11-0541 Table 5-12.

TABLE 5-12
MINIMUM PIPE INSULATION THICKNESS[1]

Fluid Design Operating Temp. Range, °F	Insulation Conductivity		Normal Pipe or Tube Size (in.)				
	Conductivity Range Btu•in./(h•ft^2•°F)	Mean Rating Temp. °F	<1	1 to <1-1/2	1-1/2 to <4	4 to <8	>8
Heating Systems (Steam, Steam Condensate and Hot Water)[2]							
>350	0.32-0.34	250	3.0	3.5	3.5	4.5	4.5
251-350	0.29-0.32	200	2.0	3.0	3.5	3.5	3.5
201-250	0.27-0.30	150	2.0	2.0	2.5	2.5	2.5
141-200	0.25-0.29	125	1.5	1.5	1.5	2.0	2.0
105-140	0.22-0.28	100	1.0	1.0	1.5	1.5	1.5
Domestic and Service Hot Water Systems							
≥105	0.22-0.28	100	1.0	1.0	1.5	1.5	1.5
Cooling Systems (Chilled Water, Brine and Refrigerant)							
40-60	0.22-0.28	100	1.0	1.0	1.5	1.5	1.5
<40	0.22-0.28	100	1.0	1.5	1.5	1.5	2.0

1. For insulation outside the stated conductivity range, the minimum thickness (T) shall be determined as follows:

$$T = r\{(1 + t/r)K/k - 1\}$$

Where:

T = Minimum insulation thickness, inches
r = Actual outside radius of pipe, inches
t = Insulation thickness from Table 5-12 for applicable fluid temperature and pipe size
K = Conductivity of alternate material at the mean rating temperature indicated for the applicable fluid temperature, Btu•in(h•ft^2•°F)
k = The upper value of the conductivity range listed in Table 5-12 for the applicable fluid temperature

2. Piping insulation is not required between the control valve and coil on runouts when the control valve is located within 4 feet of the coil and the pipe size is 1 inch or less.

[Statutory Authority: RCW 19.27A.025, 19.27A.045. 10-03-115, 10-13-113 and 10-22-056, § 51-11-0541, filed 1/20/10, 6/21/10 and 10/28/10, effective 1/1/11; 98-03-003, § 51-11-0541, filed 1/8/98, effective 7/1/98. Statutory Authority: Chapter 19.27A RCW. 92-01-140, § 51-11-0541, filed 12/19/91, effective 7/1/92.]

Reviser's note: Notice of Objection: The Joint Administrative Rules Review Committee (Committee) finds that, in adopting the 2009 proposed changes to the State Energy Code, Chapter 51-11 WAC, on November 20, 2009, the State Building Code Council (Council) failed to comply with all requirements of the law and failed to adequately respond to the Committee's request for additional economic impact and cost-benefit analyses prior to adoption.

On October 1, 2009, the Committee found that the Small Business Economic Impact Statement (SBEIS) for the proposed changes filed with the Code Reviser failed to comply with all requirements of law. The Committee requested that the Council conduct a cost-benefit analysis pursuant to RCW 34.05.328 and amend the SBEIS to provide additional economic impact information, including an estimate of the number of jobs that would be created or lost as a result of compliance with all the proposed rules, as required by RCW 19.85.040 (2)(d).

The Council provided the Committee with information and data on November 18, 2009. On December 2, 2009, the Committee found that the Council failed to adequately respond to the Committee's request for additional data. Specifically, the Committee found that the Council failed to amend the SBEIS to (a) estimate the number of jobs that would be created or lost as a result of compliance with the proposed changes; and (b) support the SBEIS with a detailed and rigorous costs analysis of the cumulative impact of all the changes. In addition, the Committee found that the Council failed to provide the Committee with a cost-benefit analysis of the proposed changes and pursuant to the requirements of RCW 34.05.328.

The Committee strongly supports a process that makes thoughtful and informed progress towards changes that result in improved energy efficiency in our buildings, wherever practicable. While the Council worked diligently, it is the opinion of the Committee that the Council did not fully develop and consider the economic impacts and costs versus benefits of these significant changes to our Energy Code. Furthermore, it is the opinion of the Committee that the Council and the Legislature need this information to fully evaluate the value, impacts, and consequences of the proposed codes, with due diligence to their respective fiduciary responsibilities, in order to create the best informed public policy.

As a result, the Committee recommends that the Governor suspend the adoption and implementation of the changes to the Energy Code, Chapter 51-11 WAC, adopted by the Council on November 20, 2009, until such time as a more adequate analysis has been completed and considered by the appropriate bodies.

For all of the above stated reasons, the Committee objects to the changes to the State Energy Code, Chapter 51-11 WAC, that were adopted by the Council on November 20, 2009, and hereby directs the Code Reviser, pursuant to RCW 34.05.640(4), to publish this Notice of Objection in the Washington State Register and along with any publication in the Washington Administrative Code of changes to Chapter 51-11 WAC that were adopted by the Council in 2009 and filed with the Code Reviser.

WAC 51-11-0601 Scope.

601.1 General: This chapter establishes design criteria in terms of prescribed requirements for building construction.

The provisions of this chapter are applicable to all single-family residential dwellings. Spaces shall comply with all the requirements of Chapter 5 except for the modifications herein specified. In addition, the design shall comply with the additional energy efficiency requirements of Chapter 9.

For duplexes and townhouses, compliance shall be shown on a dwelling-unit by dwelling-unit basis. Averaging is not allowed.

For wood frame assemblies, the building envelope requirements of this chapter may be met by installing one of the prescriptive packages in Table 6-1 or 6-2. Installed components shall meet the requirements of section 602. Compliance with nominal R-Values shall be demonstrated for the thermal resistance of the added insulation in framing cavities and/or insulated sheathing only and shall not include the thermal transmittance of other building materials or air films, but shall permit interruption by occasional framing members. Other than wood frame assemblies with continuous insulation uninterrupted by framing shall also be allowed to comply with nominal R-values.

For metal frame assemblies, compliance shall be demonstrated in accordance with Chapter 4 or Chapter 5 based on the assemblies in Chapter 10. Compliance with nominal R-values is not allowed, unless the full nominal R-value of the insulation is installed either inside or outside of the framing and is uninterrupted by framing.

[Statutory Authority: RCW 19.27A.025, 19.27A.045. 10-03-115, 10-13-113 and 10-22-056, § 51-11-0601, filed 1/20/10, 6/21/10 and 10/28/10, effective 1/1/11. Statutory Authority: RCW 19.27A.020, 19.27A.045. 04-01-106, § 51-11-0601, filed 12/17/03, effective 7/1/04; 02-24-076, § 51-11-0601, filed 12/4/02, effective 5/1/03. Statutory Authority: RCW 19.27A.025, 19.27A.045. 02-01-112, § 51-11-0601, filed 12/18/01, effective 7/1/02; 01-03-010, § 51-11-0601, filed 1/5/01, effective 7/1/01. Statutory Authority: Chapters 19.27, 19.27A and 34.05 RCW. 94-05-059, § 51-11-0601, filed 2/10/94, effective 4/1/94. Statutory Authority: RCW 19.27A.020 and 1990 c 2. 91-01-112, § 51-11-0601, filed 12/19/90, effective 7/1/91.]

Reviser's note: Notice of Objection: The Joint Administrative Rules Review Committee (Committee) finds that, in adopting the 2009 proposed changes to the State Energy Code, Chapter 51-11 WAC, on November 20, 2009, the State Building Code Council (Council) failed to comply with all requirements of the law and failed to adequately respond to the Committee's request for additional economic impact and cost-benefit analyses prior to adoption.

On October 1, 2009, the Committee found that the Small Business Economic Impact Statement (SBEIS) for the proposed changes filed with the Code Reviser failed to comply with all requirements of law. The Committee requested that the Council conduct a cost-benefit analysis pursuant to RCW 34.05.328 and amend the SBEIS to provide additional economic impact information, including an estimate of the number of jobs that would be created or lost as a result of compliance with all the proposed rules, as required by RCW 19.85.040 (2)(d).

The Council provided the Committee with information and data on November 18, 2009. On December 2, 2009, the Committee found that the Council failed to adequately respond to the Committee's request for additional data. Specifically, the Committee found that the Council failed to amend the SBEIS to (a) estimate the number of jobs that would be created or lost as a result of compliance with the proposed changes; and (b) support the SBEIS with a detailed and rigorous costs analysis of the cumulative impact of all the changes. In addition, the Committee found that the Council failed to provide the Committee with a cost-benefit analysis of the proposed changes and pursuant to the requirements of RCW 34.05.328.

The Committee strongly supports a process that makes thoughtful and informed progress towards changes that result in improved energy efficiency in our buildings, wherever practicable. While the Council worked diligently, it is the opinion of the Committee that the Council did not fully develop and consider the economic impacts and costs versus benefits of these significant changes to our Energy Code. Furthermore, it is the opinion of the Committee that the Council and the Legislature need this information to fully evaluate the value, impacts, and consequences of the proposed codes, with due diligence to their respective fiduciary responsibilities, in order to create the best informed public policy.

As a result, the Committee recommends that the Governor suspend the adoption and implementation of the changes to the Energy Code, Chapter 51-11 WAC, adopted by the Council on November 20, 2009, until such time as a more adequate analysis has been completed and considered by the appropriate bodies.

For all of the above stated reasons, the Committee objects to the changes to the State Energy Code, Chapter 51-11 WAC, that were adopted by the Council on November 20, 2009, and hereby directs the Code Reviser, pursuant to RCW 34.05.640(4), to publish this Notice of Objection in the Washington State Register and along with any publication in the Washington Administrative Code of changes to Chapter 51-11 WAC that were adopted by the Council in 2009 and filed with the Code Reviser.

WAC 51-11-0602 Building envelope requirements for single-family residential.

602.1 Roof/Ceiling: Ceilings below vented attics and single-rafter, joist-vaulted ceilings shall be insulated to not less than the nominal R-value specified for ceilings in Table 6-1 or 6-2 as applicable.

602.2 Exterior Walls Both Above and Below Grade: Above grade exterior walls shall be insulated to not less than the nominal R-value specified in Table 6-1 or 6-2 as applicable. The following walls should be considered to meet R-21 without additional documentation:

1. 2 x 6 framed and insulated with R-21 fiberglass batts.

2. 2 x 4 framed and insulated with R-15 fiberglass batts plus R-4.0 foam sheathing.

3. 2 x 4 framed and insulated with R-13 fiberglass batts plus R-5.0 foam sheathing.

4. 2 x 6 framed and insulated to full depth with spray applied or blown insulation having a minimum R-value of 3.6 per inch of thickness.

602.3 Exterior Walls (Below Grade): Below grade exterior walls surrounding conditioned space shall be insulated to

not less than the nominal R-value specified for below grade walls in Table 6-1 or 6-2 as applicable.

602.4 Slab-on-grade Floors: Slab-on-grade floors shall be insulated along their perimeter to not less than the nominal R-values specified for slab-on-grade floors in Table 6-1 or 6-2 as applicable. Slab insulation shall be installed in compliance with section 502.1.4.8. See Chapter 5, section 502.1.4.9, for additional requirements for radiant slab heating.

602.5 Floors Over Unconditioned Space: Floors over unconditioned spaces, such as vented crawl spaces, unconditioned basements, and parking garages shall be insulated to not less than the nominal R-value shown for floors over unconditioned spaces, in Table 6-1 or 6-2.

602.6 Exterior Doors: Doors shall comply with Sections 602.6.1 and 602.6.2.

EXCEPTIONS: 1. Glazed doors whose area and U-factor are included in the calculations for compliance with the requirements for glazing in section 602.7 shall be exempt from the door U-factor requirements prescribed in Table 6-1 or 6-2.

2. One unlabeled or untested exterior swinging door with the maximum area of 24 square feet may be installed per unit for ornamental, security or architectural purposes. Products using this exception shall not be included in either the U-factor or glazing area calculation requirements.

602.6.1 Exterior Door Area: For half-lite and full-lite doors, the glazing area shall be included in calculating the allowed total glazing area in Section 602.7.1.

602.6.2 Exterior Door U-Factor: Doors, including fire doors, shall have a maximum area weighted average U-factor not exceeding that prescribed in Table 6-1 or 6-2.

602.7 Glazing:

602.7.1 Glazing Area: The total glazing area as defined in Chapter 2 shall not exceed the percentage of gross conditioned floor area specified in Table 6-1 or 6-2. This area shall also include any glazing in doors.

602.7.2 Glazing U-Factor: The total glazing area as defined in Chapter 2 shall have an area weighted average U-factor not to exceed that specified in Table 6-1 or 6-2. U-factors for glazing shall be determined in accordance with section 502.1.5. These areas and U-factors shall also include any doors using the exception of section 602.6.

If the U-factors for all vertical and overhead glazing products are below the appropriate U-factor specified, then no calculations are required. If compliance is to be achieved through an area weighted calculation, then the areas and U-factors shall be included in the plans submitted with a building permit application.

EXCEPTION: Double glazed garden windows with a wood or vinyl frame shall be exempt from the U-factor calculations but shall have its area tripled and shall be included in the percentage of the total glazing area as allowed for in Table 6-1 or 6-2. The maximum area (before tripling) allowed for the total of all garden windows is one percent of the floor area or 20 square feet, whichever is less.

602.8 Air Leakage For Single-Family Residential: The minimum air leakage control measures shall be as specified in section 502.4 as applicable, including building envelope air leakage testing.

[Statutory Authority: RCW 19.27A.025, 19.27A.045. 10-03-115, 10-13-113 and 10-22-056, § 51-11-0602, filed 1/20/10, 6/21/10 and 10/28/10, effective 1/1/11. Statutory Authority: RCW 19.27A.022, 19.27A.025, 19.27A.045, and chapters 19.27 and 34.05 RCW. 07-01-089, § 51-11-0602, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27A.020, 19.27A.045. 02-24-076, § 51-11-0602, filed 12/4/02, effective 5/1/03. Statutory Authority: RCW 19.27A.025, 19.27A.045. 02-01-112, § 51-11-0602, filed 12/18/01, effective 7/1/02; 98-03-003, § 51-11-0602, filed 1/8/98, effective 7/1/98. Statutory Authority: Chapters 19.27, 19.27A and 34.05 RCW. 94-05-059, § 51-11-0602, filed 2/10/94, effective 4/1/94. Statutory Authority: RCW 19.27A.020 and 1990 c 2. 91-01-112, § 51-11-0602, filed 12/19/90, effective 7/1/91.]

Reviser's note: Notice of Objection: The Joint Administrative Rules Review Committee (Committee) finds that, in adopting the 2009 proposed changes to the State Energy Code, Chapter 51-11 WAC, on November 20, 2009, the State Building Code Council (Council) failed to comply with all requirements of the law and failed to adequately respond to the Committee's request for additional economic impact and cost-benefit analyses prior to adoption.

On October 1, 2009, the Committee found that the Small Business Economic Impact Statement (SBEIS) for the proposed changes filed with the Code Reviser failed to comply with all requirements of law. The Committee requested that the Council conduct a cost-benefit analysis pursuant to RCW 34.05.328 and amend the SBEIS to provide additional economic impact information, including an estimate of the number of jobs that would be created or lost as a result of compliance with all the proposed rules, as required by RCW 19.85.040 (2)(d).

The Council provided the Committee with information and data on November 18, 2009. On December 2, 2009, the Committee found that the Council failed to adequately respond to the Committee's request for additional data. Specifically, the Committee found that the Council failed to amend the SBEIS to (a) estimate the number of jobs that would be created or lost as a result of compliance with the proposed changes; and (b) support the SBEIS with a detailed and rigorous costs analysis of the cumulative impact of all the changes. In addition, the Committee found that the Council failed to provide the Committee with a cost-benefit analysis of the proposed changes and pursuant to the requirements of RCW 34.05.328.

The Committee strongly supports a process that makes thoughtful and informed progress towards changes that result in improved energy efficiency in our buildings, wherever practicable. While the Council worked diligently, it is the opinion of the Committee that the Council did not fully develop and consider the economic impacts and costs versus benefits of these significant changes to our Energy Code. Furthermore, it is the opinion of the Committee that the Council and the Legislature need this information to fully evaluate the value, impacts, and consequences of the proposed codes, with due diligence to their respective fiduciary responsibilities, in order to create the best informed public policy.

As a result, the Committee recommends that the Governor suspend the adoption and implementation of the changes to the Energy Code, Chapter 51-11 WAC, adopted by the Council on November 20, 2009, until such time as a more adequate analysis has been completed and considered by the appropriate bodies.

For all of the above stated reasons, the Committee objects to the changes to the State Energy Code, Chapter 51-11 WAC, that were adopted by the Council on November 20, 2009, and hereby directs the Code Reviser, pursuant to RCW 34.05.640(4), to publish this Notice of Objection in the Washington State Register and along with any publication in the Washington Administrative Code of changes to Chapter 51-11 WAC that were adopted by the Council in 2009 and filed with the Code Reviser.

WAC 51-11-0603 Mechanical systems for single-family residential.

603.1: Spaces that are heated by air-to-air, ground-to-air, or water-to-air heat pumps shall comply with Table 6-1 or 6-2. System sizing shall be determined by an analysis consistent with section 503.2 of this Code. All mechanical equipment efficiencies shall comply with standard as stated in Section 503 of this Code.

[Statutory Authority: RCW 19.27A.025, 19.27A.045. 10-03-115, 10-13-113 and 10-22-056, § 51-11-0603, filed 1/20/10, 6/21/10 and 10/28/10, effective 1/1/11; 02-01-112, § 51-11-0603, filed 12/18/01, effective 7/1/02. Statutory Authority: Chapters 19.27, 19.27A and 34.05 RCW. 94-05-059, § 51-11-0603, filed 2/10/94, effective 4/1/94. Statutory Authority: RCW 19.27A.020 and 1990 c 2. 91-01-112, § 51-11-0603, filed 12/19/90, effective 7/1/91.]

Reviser's note: Notice of Objection: The Joint Administrative Rules Review Committee (Committee) finds that, in adopting the 2009 proposed changes to the State Energy Code, Chapter 51-11 WAC, on November 20, 2009, the State Building Code Council (Council) failed to comply with all requirements of the law and failed to adequately respond to the Committee's request for additional economic impact and cost-benefit analyses prior to adoption.

On October 1, 2009, the Committee found that the Small Business Economic Impact Statement (SBEIS) for the proposed changes filed with the Code Reviser failed to comply with all requirements of law. The Committee requested that the Council conduct a cost-benefit analysis pursuant to RCW 34.05.328 and amend the SBEIS to provide additional economic impact information, including an estimate of the number of jobs that would be created or lost as a result of compliance with all the proposed rules, as required by RCW 19.85.040 (2)(d).

The Council provided the Committee with information and data on November 18, 2009. On December 2, 2009, the Committee found that the Council failed to adequately respond to the Committee's request for additional data. Specifically, the Committee found that the Council failed to amend the SBEIS to (a) estimate the number of jobs that would be created or lost as a result of compliance with the proposed changes; and (b) support the SBEIS with a detailed and rigorous costs analysis of the cumulative impact of all the changes. In addition, the Committee found that the Council failed to provide the Committee with a cost-benefit analysis of the proposed changes and pursuant to the requirements of RCW 34.05.328.

The Committee strongly supports a process that makes thoughtful and informed progress towards changes that result in improved energy efficiency in our buildings, wherever practicable. While the Council worked diligently, it is the opinion of the Committee that the Council did not fully develop and consider the economic impacts and costs versus benefits of these significant changes to our Energy Code. Furthermore, it is the opinion of the Committee that the Council and the Legislature need this information to fully evaluate the value, impacts, and consequences of the proposed codes, with due diligence to their respective fiduciary responsibilities, in order to create the best informed public policy.

As a result, the Committee recommends that the Governor suspend the adoption and implementation of the changes to the Energy Code, Chapter 51-11 WAC, adopted by the Council on November 20, 2009, until such time as a more adequate analysis has been completed and considered by the appropriate bodies.

For all of the above stated reasons, the Committee objects to the changes to the State Energy Code, Chapter 51-11 WAC, that were adopted by the Council on November 20, 2009, and hereby directs the Code Reviser, pursuant to RCW 34.05.640(4), to publish this Notice of Objection in the Washington State Register and along with any publication in the Washington Administrative Code of changes to Chapter 51-11 WAC that were adopted by the Council in 2009 and filed with the Code Reviser.

WAC 51-11-0604 Domestic water systems.

Domestic water systems, including plumbing fixtures and appliances, shall comply with Section 504.

[Statutory Authority: RCW 19.27A.025, 19.27A.045. 10-03-115, 10-13-113 and 10-22-056, § 51-11-0604, filed 1/20/10, 6/21/10 and 10/28/10, effective 1/1/11; 01-03-010, § 51-11-0604, filed 1/5/01, effective 7/1/01. Statutory Authority: RCW 19.27A.020 and 1990 c 2. 91-01-112, § 51-11-0604, filed 12/19/90, effective 7/1/91.]

Reviser's note: Notice of Objection: The Joint Administrative Rules Review Committee (Committee) finds that, in adopting the 2009 proposed changes to the State Energy Code, Chapter 51-11 WAC, on November 20, 2009, the State Building Code Council (Council) failed to comply with all requirements of the law and failed to adequately respond to the Committee's request for additional economic impact and cost-benefit analyses prior to adoption.

On October 1, 2009, the Committee found that the Small Business Economic Impact Statement (SBEIS) for the proposed changes filed with the Code Reviser failed to comply with all requirements of law. The Committee requested that the Council conduct a cost-benefit analysis pursuant to RCW 34.05.328 and amend the SBEIS to provide additional economic impact information, including an estimate of the number of jobs that would be created or lost as a result of compliance with all the proposed rules, as required by RCW 19.85.040 (2)(d).

The Council provided the Committee with information and data on November 18, 2009. On December 2, 2009, the Committee found that the Council failed to adequately respond to the Committee's request for additional data. Specifically, the Committee found that the Council failed to amend the SBEIS to (a) estimate the number of jobs that would be created or lost as a result of compliance with the proposed changes; and (b) support the SBEIS with a detailed and rigorous costs analysis of the cumulative impact of all the changes. In addition, the Committee found that the Council failed to provide the Committee with a cost-benefit analysis of the proposed changes and pursuant to the requirements of RCW 34.05.328.

The Committee strongly supports a process that makes thoughtful and informed progress towards changes that result in improved energy efficiency in our buildings, wherever practicable. While the Council worked diligently, it is the opinion of the Committee that the Council did not fully develop and consider the economic impacts and costs versus benefits of these significant changes to our Energy Code. Furthermore, it is the opinion of the Committee that the Council and the Legislature need this information to fully evaluate the value, impacts, and consequences of the proposed codes, with due diligence to their respective fiduciary responsibilities, in order to create the best informed public policy.

As a result, the Committee recommends that the Governor suspend the adoption and implementation of the changes to the Energy Code, Chapter 51-11 WAC, adopted by the Council on November 20, 2009, until such time as a more adequate analysis has been completed and considered by the appropriate bodies.

For all of the above stated reasons, the Committee objects to the changes to the State Energy Code, Chapter 51-11 WAC, that were adopted by the Council on November 20, 2009, and hereby directs the Code Reviser, pursuant to RCW 34.05.640(4), to publish this Notice of Objection in the Washington State Register and along with any publication in the Washington Administrative Code of changes to Chapter 51-11 WAC that were adopted by the Council in 2009 and filed with the Code Reviser.

WAC 51-11-0625 Table 6-1.

TABLE 6-1
PRESCRIPTIVE REQUIREMENTS[0,1] FOR SINGLE-FAMILY RESIDENTIAL
CLIMATE ZONE 1

Option	Glazing Area[10]: % of Floor	Glazing U-Factor		Door[9] U-Factor	Ceiling[2]	Vaulted Ceiling[3]	Wall[12] Above Grade	Wall• int[4] Below Grade	Wall• ext[4] Below Grade	Floor[5]	Slab[6] on Grade
		Vertical	Overhead[11]								
I.	13%	0.34	0.50	0.20	R-49 or R-38 adv	R-38	R-21 int[7]	R-21 TB	R-10	R-30	R-10 2'
II.*	25%	0.32	0.50	0.20	R-49 or R-38 adv	R-38	R-21 int[7]	R-21 TB	R-10	R-30	R-10 2'
III.	Unlimited	0.30	0.50	0.20	R-49 or R-38 adv	R-38	R-21 int[7]	R-21 TB	R-10	R-30	R-10 2'

* Reference Case

0. Nominal R-values are for wood frame assemblies only or assemblies built in accordance with Section 601.1.

1. Minimum requirements for each option listed. For example, if a proposed design has a glazing ratio to the conditioned floor area of 15%, it shall comply with all of the requirements of the 25% glazing option (or higher). Proposed designs which cannot meet the specific requirements of a listed option above may calculate compliance by Chapters 4 or 5 of this Code.
2. Requirement applies to all ceilings except single rafter or joist vaulted ceilings complying with note 3. 'Adv' denotes Advanced Framed Ceiling.
3. Requirement applicable only to single rafter or joist vaulted ceilings.
4. Below grade walls shall be insulated either on the exterior to a minimum level of R-10, continuous or on the interior as a framed wall. Exterior insulation installed on below grade walls shall be a water resistant material, manufactured for its intended use, and installed according to the manufacturer's specifications. See Section 602.2.
5. Floors over crawl spaces or exposed to ambient air conditions.
6. Required slab perimeter insulation shall be a water resistant material, manufactured for its intended use, and installed according to manufacturer's specifications. See Section 602.4. For slabs inside a foundation wall, the insulation shall be installed to provide a thermal break (TB) between the slab edge and the foundation. Monolithic slabs shall include insulation, installed outside the foundation wall, and shall extend downward from the top of the slab for a minimum distance of 24 inches or downward and then horizontally for a minimum combined distance of 24 inches. Monolithic slabs shall also include R-10 insulation under the nonload bearing portions of the slab.
7. Int. denotes standard framing 16 inches on center with headers insulated with a minimum of R-10 insulation.
8. Reserved.
9. Doors, including all fire doors, shall be assigned default U-factors from Table 10-6C.
10. Where a maximum glazing area is listed, the total glazing area (combined vertical plus overhead) as a percent of gross conditioned floor area shall be less than or equal to that value. Overhead glazing with U-factor of U = 0.35 or less is not included in glazing area limitations.
11. Overhead glazing shall have U-factors determined in accordance with NFRC 100 or as specified in Section 502.1.5.
12. Log and solid timber walls with a minimum average thickness of 3.5" are exempt from this insulation requirement.

TABLE 6-2
PRESCRIPTIVE REQUIREMENTS[0,1] FOR SINGLE-FAMILY RESIDENTIAL
CLIMATE ZONE 2

Option	Glazing Area[10]: % of Floor	Glazing U-Factor		Door[9] U-Factor	Ceiling[2]	Vaulted Ceiling[3]	Wall[12] Above Grade	Wall• int[4] Below Grade	Wall• ext[4] Below Grade	Floor[5]	Slab[6] on Grade
		Vertical	Overhead[11]								
I.	12%	0.32	0.50	0.20	R-49 or R-38 adv	R-38	R-21 int[7]	R-21 TB	R-12	R-30	R-10 2'
II.*	15%	0.32	0.50	0.20	R-49 or R-38 adv	R-38	R-19 +R-5[8]	R-21 TB	R-12	R-30	R-10 2'
III.	Unlimited	0.30	0.50	0.20	R-49 or R-38 adv	R-38	R-19 +R-5[8]	R-21 TB	R-12	R-30	R-10 2'

* Reference Case.

0. Nominal R-values are for wood frame assemblies only or assemblies built in accordance with Section 601.1.
1. Minimum requirements for each option listed. For example, if a proposed design has a glazing ratio to the conditioned floor area of 13%, it shall comply with all of the requirements of the 15% glazing option (or higher). Proposed designs which cannot meet the specific requirements of a listed option above may calculate compliance by Chapters 4 or 5 of this Code.
2. Requirement applies to all ceilings except single rafter or joist vaulted ceilings complying with note 3. 'Adv' denotes Advanced Framed Ceiling.
3. Requirement applicable only to single rafter or joist vaulted ceilings.
4. Below grade walls shall be insulated either on the exterior to a minimum level of R-12, continuous or on the interior as a framed wall. Exterior insulation installed on below grade walls shall be a water resistant material, manufactured for its intended use, and installed according to the manufacturer's specifications. See Section 602.2.
5. Floors over crawl spaces or exposed to ambient air conditions.
6. Required slab perimeter insulation shall be a water resistant material, manufactured for its intended use, and installed according to manufacturer's specifications. See Section 602.4. For slabs inside a foundation wall, the insulation shall be installed to provide a thermal break (TB) between the slab edge and the foundation. Monolithic slabs shall include insulation, installed outside the foundation wall, and shall extend downward from the top of the slab for a minimum distance of 24 inches or downward and then horizontally for a minimum combined distance of 24 inches. Monolithic slabs shall also include R-10 insulation under the nonload bearing portions of the slab.
7. Int. denotes standard framing 16 inches on center with headers insulated with a minimum of R-10 insulation.
8. Reserved.
9. Doors, including all fire doors, shall be assigned default U-factors from Table 10-6C.
10. Where a maximum glazing area is listed, the total glazing area (combined vertical plus overhead) as a percent of gross conditioned floor area shall be less than or equal to that value. Overhead glazing with U-factor of U = 0.35 or less is not included in glazing area limitations.
11. Overhead glazing shall have U-factors determined in accordance with NFRC 100 or as specified in Section 502.1.5.
12. Log and solid timber walls with a minimum average thickness of 3.5" are exempt from this insulation requirement.

[Statutory Authority: RCW 19.27A.025, 19.27A.045. 10-22-057, § 51-11-0625, filed 10/28/10, effective 1/1/11; 10-03-115, 10-13-113 and 10-22-056, § 51-11-0625, filed 1/20/10, 6/21/10 and 10/28/10, effective 1/1/11. Statutory Authority: RCW 19.27A.022, 19.27A.025, 19.27A.045, and chapters 19.27 and 34.05 RCW. 07-01-089, § 51-11-0625, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27A.020, 19.27A.045. 04-01-106, § 51-11-0625, filed 12/17/03, effective 7/1/04; 02-24-076, § 51-11-0625, filed 12/4/02, effective 5/1/03. Statutory Authority: RCW 19.27A.025, 19.27A.045. 02-01-112, § 51-11-0625, filed 12/18/01, effective 7/1/02; 01-03-010, § 51-11-0625, filed 1/5/01, effective 7/1/01; 98-03-003, § 51-11-0625, filed 1/8/98, effective 7/1/98. Statutory Authority: Chapters 19.27 and 19.27A RCW and 1994 c 226. 95-01-126, § 51-11-0625, filed 12/21/94, effective 6/30/95. Statutory Authority: Chapters 19.27, 19.27A and 34.05 RCW. 94-05-059, § 51-11-0625, filed 2/10/94, effective 4/1/94. Statutory Authority: Chapter 19.27A RCW. 92-01-140, § 51-11-0625, filed 12/19/91, effective 7/1/92.]

Reviser's note: Notice of Objection: The Joint Administrative Rules Review Committee (Committee) finds that, in adopting the 2009 proposed changes to the State Energy Code, Chapter 51-11 WAC, on November 20, 2009, the State Building Code Council (Council) failed to comply with all requirements of the law and failed to adequately respond to the Committee's request for additional economic impact and cost-benefit analyses prior to adoption.

On October 1, 2009, the Committee found that the Small Business Economic Impact Statement (SBEIS) for the proposed changes filed with the Code Reviser failed to comply with all requirements of law. The Committee requested that the Council conduct a cost-benefit analysis pursuant to RCW 34.05.328 and amend the SBEIS to provide additional economic impact information, including an estimate of the number of jobs that would be created or lost as a result of compliance with all the proposed rules, as required by RCW 19.85.040 (2)(d).

The Council provided the Committee with information and data on November 18, 2009. On December 2, 2009, the Committee found that the Council failed to adequately respond to the Committee's request for additional data. Specifically, the Committee found that the Council failed to amend the SBEIS to (a) estimate the number of jobs that would be created or lost as a result of compliance with the proposed changes; and (b) support the SBEIS with a detailed and rigorous costs analysis of the cumulative impact of all the changes. In addition, the Committee found that the Council failed to provide the Committee with a cost-benefit analysis of the proposed changes and pursuant to the requirements of RCW 34.05.328.

The Committee strongly supports a process that makes thoughtful and informed progress towards changes that result in improved energy efficiency in our buildings, wherever practicable. While the Council worked diligently, it is the opinion of the Committee that the Council did not fully develop and consider the economic impacts and costs versus benefits of these significant changes to our Energy Code. Furthermore, it is the opinion of the Committee that the Council and the Legislature need this information to fully evaluate the value, impacts, and consequences of the proposed codes, with due diligence to their respective fiduciary responsibilities, in order to create the best informed public policy.

As a result, the Committee recommends that the Governor suspend the adoption and implementation of the changes to the Energy Code, Chapter 51-11 WAC, adopted by the Council on November 20, 2009, until such time as a more adequate analysis has been completed and considered by the appropriate bodies.

For all of the above stated reasons, the Committee objects to the changes to the State Energy Code, Chapter 51-11 WAC, that were adopted by the Council on November 20, 2009, and hereby directs the Code Reviser, pursuant to RCW 34.05.640(4), to publish this Notice of Objection in the Washington State Register and along with any publication in the Washington Administrative Code of changes to Chapter 51-11 WAC that were adopted by the Council in 2009 and filed with the Code Reviser.

WAC 51-11-0701 Scope. The following standards shall apply to Chapters 1 through 20. The standards and portions thereof, which are referred to in various parts of this Code shall be part of the Washington State Energy Code and are hereby declared to be a part of this Code.

REFERENCE STANDARD NO.	TITLE AND SOURCE
RS-1	2009 ASHRAE Fundamentals Handbook.
RS-2	Super Good Cents Technical Reference C Builder's Field Guide.
RS-3	(Reserved).
RS-4	ASHRAE Standard 55-2004 Thermal Environmental Conditions for Human Occupancy.
RS-5	2006 ASHRAE Refrigeration Handbook.
RS-6	(Reserved.)
RS-7	SMACNA, HVAC Duct Construction Standards, Metal and Flexible, 2005.
RS-8	(Reserved.)
RS-9	ASHRAE/IESNA Standard 90.1-2007, Energy Standard for Buildings Except Low-Rise Residential Buildings.
RS-10	2008 ASHRAE HVAC Systems and Equipment Handbook.
RS-11	2007 ASHRAE HVAC Applications Handbook.
RS-12	through RS-28 (Reserved).
RS-29	Nonresidential Building Design by Systems Analysis.
RS-30	Title 10, Code of Federal Regulations (CFR), Part 430 (March 14, 1988).
RS-31	National Fenestration Rating Council (NFRC) Standard 100-2004.
RS-32	Seattle EnvStd 2006.
RS-33	Duct Testing Standard for New and Existing Construction, Washington State University Extension Energy Program Publication #WSUEEP 09-008.
RS-34	Optional Acceptance Requirements for Nonresidential Buildings, SBCC 2009.

ACCREDITED AUTHORITATIVE AGENCIES

ANSI refers to the American National Standards Institute, Inc., 11 West 42nd Street, New York, NY 10036
Phone 212-642-4900 fax 212-398-0023, internet www.ansi.org

AHRI refers to the Air Conditioning, Heating and Refrigeration Institute, 4301 N. Fairfax Dr., Suite 425, Arlington, VA 22203
Phone 703-524-8800 fax 703-528-3816, internet www.ari.org

ASHRAE refers to the American Society of Heating, Refrigerating, and Air Conditioning Engineers, Inc., 1791 Tullie Circle, N.E., Atlanta, GA 30329
Phone 404-636-8400 fax 404-321-5478, internet www.ashrae.org

ASTM refers to the American Society for Testing and Materials, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959
Phone 610-832-9585 fax 610-832-9555, internet www.astm.org

CTI refers to the Cooling Tower Institute, 530 Wells Fargo Drive, Suite 218, Houston, TX 77090
Phone 281-583-4087 fax 281-537-1721, internet www.cti.org

IESNA refers to the Illuminating Engineering Society of North America, 120 Wall Street, Floor 17, New York, NY 10005-4001
Phone 212-248-5000 fax 212-248-5017, internet www.iesna.org

NFRC refers to the National Fenestration Rating Council, Incorporated, 8484 Georgia Avenue, Suite 320, Silver Spring, Maryland 20910
Phone 301-589-1776 fax 301-589-3884, internet www.nfrc.org

SBCC refers to the Washington State Building Code Council, P.O. Box 42525, Olympia, WA 98504-2525
Phone 360-725-2990 fax 360-586-9383, internet www.sbcc.wa.gov

SMACNA refers to the Sheet Metal and Air Conditioning Contractors National Association, Inc., 4201 Lafayette Center Drive, P.O. Box 221230, Chantilly, VA 20153-1230
Phone 703-803-2980 fax 703-803-3732, internet www.smacna.org

WSU refers to the Washington State University Extension Energy Program, 905 Plum Street S.E., Building #3, P.O. Box 43165, Olympia, WA 98506-3166
Phone 360-956-2000 fax 360-956-2217, internet www.energy.wsu.edu

[Statutory Authority: RCW 19.27A.025, 19.27A.045. 10-03-115, 10-13-113 and 10-22-056, § 51-11-0701, filed 1/20/10, 6/21/10 and 10/28/10, effective 1/1/11. Statutory Authority: RCW 19.27A.022, 19.27A.025, 19.27A.045, and chapters 19.27 and 34.05 RCW. 07-01-089, § 51-11-0701, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27A.020, 19.27A.-045. 04-01-106, § 51-11-0701, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27A.025, 19.27A.045. 01-03-010, § 51-11-0701, filed 1/5/01, effective 7/1/01; 98-03-003, § 51-11-0701, filed 1/8/98, effective

7/1/98. Statutory Authority: RCW 19.27A.020 and 1990 c 2. 91-01-112, § 51-11-0701, filed 12/19/90, effective 7/1/91.]

Reviser's note: Notice of Objection: The Joint Administrative Rules Review Committee (Committee) finds that, in adopting the 2009 proposed changes to the State Energy Code, Chapter 51-11 WAC, on November 20, 2009, the State Building Code Council (Council) failed to comply with all requirements of the law and failed to adequately respond to the Committee's request for additional economic impact and cost-benefit analyses prior to adoption.

On October 1, 2009, the Committee found that the Small Business Economic Impact Statement (SBEIS) for the proposed changes filed with the Code Reviser failed to comply with all requirements of law. The Committee requested that the Council conduct a cost-benefit analysis pursuant to RCW 34.05.328 and amend the SBEIS to provide additional economic impact information, including an estimate of the number of jobs that would be created or lost as a result of compliance with all the proposed rules, as required by RCW 19.85.040 (2)(d).

The Council provided the Committee with information and data on November 18, 2009. On December 2, 2009, the Committee found that the Council failed to adequately respond to the Committee's request for additional data. Specifically, the Committee found that the Council failed to amend the SBEIS to (a) estimate the number of jobs that would be created or lost as a result of compliance with the proposed changes; and (b) support the SBEIS with a detailed and rigorous costs analysis of the cumulative impact of all the changes. In addition, the Committee found that the Council failed to provide the Committee with a cost-benefit analysis of the proposed changes and pursuant to the requirements of RCW 34.05.328.

The Committee strongly supports a process that makes thoughtful and informed progress towards changes that result in improved energy efficiency in our buildings, wherever practicable. While the Council worked diligently, it is the opinion of the Committee that the Council did not fully develop and consider the economic impacts and costs versus benefits of these significant changes to our Energy Code. Furthermore, it is the opinion of the Committee that the Council and the Legislature need this information to fully evaluate the value, impacts, and consequences of the proposed codes, with due diligence to their respective fiduciary responsibilities, in order to create the best informed public policy.

As a result, the Committee recommends that the Governor suspend the adoption and implementation of the changes to the Energy Code, Chapter 51-11 WAC, adopted by the Council on November 20, 2009, until such time as a more adequate analysis has been completed and considered by the appropriate bodies.

For all of the above stated reasons, the Committee objects to the changes to the State Energy Code, Chapter 51-11 WAC, that were adopted by the Council on November 20, 2009, and hereby directs the Code Reviser, pursuant to RCW 34.05.640(4), to publish this Notice of Objection in the Washington State Register and along with any publication in the Washington Administrative Code of changes to Chapter 51-11 WAC that were adopted by the Council in 2009 and filed with the Code Reviser.

WAC 51-11-0800 Section 0800—Suggested software for chapter 4 systems analysis approach. The simulation program shall be tested according to ANSI/ASHRAE Standard 140 and the results shall be furnished by the software provider.

The following is a list of suggested software, but not limited to:

Program Name:	Source
DOE 2.1E	Energy Science Technology Software Center (ESTSC) P.O. Box 1220 Oakridge, TN 37831-1020 423-576-2606
DOE 2.2 (EQuest)	James J. Hirsch & Associates Building Performance Analysis Software & Consulting 12185 Presilla Road Camarillo, CA 93012-9243 805-532-1045
Program Name:	Source
EnergyPlus	Kathy Ellington Lawrence Berkeley National Laboratory (LBNL) Building 90, Room 3147 Berkeley, CA 94720-0001 510-486-5711

[Statutory Authority: RCW 19.27A.025, 19.27A.045. 10-03-115, 10-13-113 and 10-22-056, § 51-11-0800, filed 1/20/10, 6/21/10 and 10/28/10, effective 1/1/11. Statutory Authority: RCW 19.27A.020, 19.27A.045. 02-24-076, § 51-11-0800, filed 12/4/02, effective 5/1/03. Statutory Authority: RCW 19.27A.025 and 19.27A.045. 98-03-003, § 51-11-0800, filed 1/8/98, effective 7/1/98. Statutory Authority: RCW 19.27A.020 and 1990 c 2. 91-01-112, § 51-11-0800, filed 12/19/90, effective 7/1/91.]

Reviser's note: Notice of Objection: The Joint Administrative Rules Review Committee (Committee) finds that, in adopting the 2009 proposed changes to the State Energy Code, Chapter 51-11 WAC, on November 20, 2009, the State Building Code Council (Council) failed to comply with all requirements of the law and failed to adequately respond to the Committee's request for additional economic impact and cost-benefit analyses prior to adoption.

On October 1, 2009, the Committee found that the Small Business Economic Impact Statement (SBEIS) for the proposed changes filed with the Code Reviser failed to comply with all requirements of law. The Committee requested that the Council conduct a cost-benefit analysis pursuant to RCW 34.05.328 and amend the SBEIS to provide additional economic impact information, including an estimate of the number of jobs that would be created or lost as a result of compliance with all the proposed rules, as required by RCW 19.85.040 (2)(d).

The Council provided the Committee with information and data on November 18, 2009. On December 2, 2009, the Committee found that the Council failed to adequately respond to the Committee's request for additional data. Specifically, the Committee found that the Council failed to amend the SBEIS to (a) estimate the number of jobs that would be created or lost as a result of compliance with the proposed changes; and (b) support the SBEIS with a detailed and rigorous costs analysis of the cumulative impact of all the changes. In addition, the Committee found that the Council failed to provide the Committee with a cost-benefit analysis of the proposed changes and pursuant to the requirements of RCW 34.05.328.

The Committee strongly supports a process that makes thoughtful and informed progress towards changes that result in improved energy efficiency in our buildings, wherever practicable. While the Council worked diligently, it is the opinion of the Committee that the Council did not fully develop and consider the economic impacts and costs versus benefits of these significant changes to our Energy Code. Furthermore, it is the opinion of the Committee that the Council and the Legislature need this information to fully evaluate the value, impacts, and consequences of the proposed codes, with due diligence to their respective fiduciary responsibilities, in order to create the best informed public policy.

As a result, the Committee recommends that the Governor suspend the adoption and implementation of the changes to the Energy Code, Chapter 51-11 WAC, adopted by the Council on November 20, 2009, until such time as a more adequate analysis has been completed and considered by the appropriate bodies.

For all of the above stated reasons, the Committee objects to the changes to the State Energy Code, Chapter 51-11 WAC, that were adopted by the Council on November 20, 2009, and hereby directs the Code Reviser, pursuant to RCW 34.05.640(4), to publish this Notice of Objection in the Washington State Register and along with any publication in the Washington Administrative Code of changes to Chapter 51-11 WAC that were adopted by the Council in 2009 and filed with the Code Reviser.

WAC 51-11-0900 Chapter 0900—Additional residential energy efficiency requirements.

901 Additional Residential Energy Efficiency Requirements. Dwelling units permitted under this Code shall comply with all provisions of Chapter 5 of this Code and develop 1 credit from Table 9-1.

EXCEPTION: Buildings complying using Chapter 4 Building Design by Systems Analysis shall meet this provision of this section by demonstrating that the proposed

building energy use is 8 percent less than the target building energy use.

TABLE 9-1
ENERGY CREDITS (DEBITS)

OPTION	DESCRIPTION	CREDIT(S)
1a	HIGH EFFICIENCY HVAC EQUIPMENT 1: Gas, propane or oil-fired furnace or boiler with minimum AFUE of 92%, **or** Air-source heat pump with minimum HSPF of 8.5.	1.0
1b	HIGH EFFICIENCY HVAC EQUIPMENT 2: Closed-loop ground source heat pump; with a minimum COP of 3.3.	2.0
1c	HIGH EFFICIENCY HVAC EQUIPMENT 3: DUCTLESS SPLIT SYSTEM HEAT PUMPS, ZONAL CONTROL: In home where the primary space heating system is zonal electric heating, a ductless heat pump system shall be installed and provide heating to at least one zone of the housing unit.	1.0
2	HIGH EFFICIENCY HVAC DISTRIBUTION SYSTEM:[1] All heating and cooling system components installed inside the conditioned space. All combustion equipment shall be direct vent or sealed combustion. Locating system components in conditioned crawl spaces is not permitted under this option. Electric resistance heat is not permitted under this option. Direct combustion heating equipment with AFUE less than 80% is not permitted under this option.	1.0
3a	EFFICIENT BUILDING ENVELOPE 1: Prescriptive compliance is based on Table 6-1, Option III with the following modifications: Window U = 0.28 floor R-38, slab on grade R-10 full, below grade slab R-10 full. **or** Component performance compliance: Reduce the Target UA from Table 5-1 by 5%, as determined using EQUATION 1.	0.5
3b	EFFICIENT BUILDING ENVELOPE 2: Prescriptive compliance is based on Table 6-1, Option III with the following modifications: Window U = 0.25 and wall R-21 plus R-4 and R-38 floor, slab on grade R-10 full, below grade slab R-10 full, and R-21 plus R-5 below grade basement walls. **or** Component performance compliance: Reduce the Target UA from Table 5.1 by 15%, as determined using EQUATION 1.	1.0
3c	SUPER-EFFICIENT BUILDING ENVELOPE 3: Prescriptive compliance is based on Table 6-1, Option III with the following modifications: Window U = 0.22 and wall R-21 plus R-12 and R-38 floor, slab on grade R-10 full, below grade slab R-10 full and R-21 plus R-12 below grade basement walls and R-49 advanced ceiling and vault. **or** Component performance compliance: Reduce the Target UA from Table 5.1 by 30%, as determined using EQUATION 1.	2.0
4a	AIR LEAKAGE CONTROL AND EFFICIENT VENTILATION: Envelope leakage reduced to SLA of 0.00020 building envelope tightness shall be considered acceptable when tested air leakage is less than specific leakage area of 0.00020 when tested with a blower door at a pressure difference of 50 PA. Testing shall occur after rough in and after installation of penetrations of the building envelope, including penetrations for utilities, plumbing, electrical, ventilation, and combustion appliances. **and** All whole house ventilation requirements as determined by Section M1508 of the Washington State Residential Code shall be met with a heat recovery ventilation system in accordance with Section M1508.7 of that Code.	0.5

OPTION	DESCRIPTION	CREDIT(S)
4b	ADDITIONAL AIR LEAKAGE CONTROL AND EFFICIENT VENTILATION: Envelope leakage reduced to SLA of 0.00015 building envelope tightness shall be considered acceptable when tested air leakage is less than specific leakage area of 0.00015 when tested with a blower door at a pressure difference of 50 PA. Testing shall occur after rough in and after installation of penetrations of the building envelope, including penetrations for utilities, plumbing, electrical, ventilation, and combustion appliances. **and** All whole house ventilation requirements as determined by Section M1508 of the Washington State Residential Code shall be met with a heat recovery ventilation system in accordance with Section M1508.7 of that Code.	1.0
5a	EFFICIENT WATER HEATING: Water heating system shall include one of the following: Gas, propane or oil water heater with a minimum EF of 0.62. **or** Electric Water Heater with a minimum EF of 0.93. **and for both cases** All showerhead and kitchen sink faucets installed in the house shall meet be rated at 1.75 GPM or less. All other lavatory faucets shall be rated at 1.0 GPM or less.[2]	0.5
5b	HIGH EFFICIENCY WATER HEATING: Water heating system shall include one of the following: Gas, propane or oil water heater with a minimum EF of 0.82. **or** Solar water heating supplementing a minimum standard water heater. Solar water heating will provide a rated minimum savings of 85 therms or 2000 kWh based on the Solar Rating and Certification Corporation (SRCC) Annual Performance of OG-300 Certified Solar Water Heating Systems. **or** Electric heat pump water heater with a minimum EF of 2.0.	1.5
6	SMALL DWELLING UNIT 1: Dwelling units less than 1500 square feet in floor area with less than 300 square feet of window + door area. Additions to existing building that are less than 750 square feet of heated floor area.	1.0
7	LARGE DWELLING UNIT 1: Dwelling units exceeding 5000 square feet of floor area shall be assessed a deduction for purposes of complying with Section 901 of this Code.	-1.0
8	RENEWABLE ELECTRIC ENERGY: For each 1200 kWh of electrical generation provided annually by on-site wind or solar equipment a 0.5 credit shall be allowed, up to 3 credits. Generation shall be calculated as follows: For solar electric systems, the design shall be demonstrated to meet this requirement using the National Renewable Energy Laboratory calculator PVWATTs. Documentation noting solar access shall be included on the plans. For wind generation projects designs shall document annual power generation based on the following factors: The wind turbine power curve; average annual wind speed at the site; frequency distribution of the wind speed at the site and height of the tower.	[0.5]

Footnotes:

1. **Interior Duct Placement:** Ducts included as Option 2 of Table 9-1 shall be placed wholly within the heated envelope of the housing unit. The placement shall be inspected and certified to receive the credits associated with this option.

EXCEPTION: Ducts complying with this section may have up to 5% of the total linear feet of ducts located in the exterior cavities or buffer spaces of the dwelling. If this exception is used the ducts will be tested to the following standards:

Post-construction test: Leakage to outdoors shall be less than or equal to 1 CFM per 100 ft^2 of conditioned floor area when tested at a pressure differential of 0.1 inches w.g. (25 Pa) across the entire system, including the manufacturer's air handler enclosure. All register boots shall be taped or otherwise sealed during the test.

2. **Plumbing Fixtures Flow Ratings.** Low flow plumbing fixtures (water closets and urinals) and fittings (faucets and showerheads) shall comply with the following requirements:

(a) Residential bathroom lavatory sink faucets: Maximum flow rate - 3.8 L/min (1.0 gal/min) when tested in accordance with ASME A112.18.1/CSA B125.1.

(b) Residential kitchen faucets: Maximum flow rate - 6.6 L/min (1.75 gal/min) when tested in accordance with ASME A112.18.1/CSA B125.1.
(c) Residential showerheads: Maximum flow rate - 6.6 L/min (1.75 gal/min) when tested in accordance with ASME A112.18.1/CSA B125.1.

[Statutory Authority: RCW 19.27A.025, 19.27A.045. 10-22-057, § 51-11-0900, filed 10/28/10, effective 1/1/11; 10-03-115, 10-13-113 and 10-22-056, § 51-11-0900, filed 1/20/10, 6/21/10 and 10/28/10, effective 1/1/11. Statutory Authority: RCW 19.27A.022, 19.27A.025, 19.27A.045, and chapters 19.27 and 34.05 RCW. 07-01-089, § 51-11-0900, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27A.020, 19.27A.045. 04-01-106, § 51-11-0900, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27A.025, 19.27A.045. 02-01-112, § 51-11-0900, filed 12/18/01, effective 7/1/02. Statutory Authority: Chapters 19.27 and 19.27A RCW and 1994 c 226. 95-01-126, § 51-11-0900, filed 12/21/94, effective 6/30/95. Statutory Authority: RCW 19.27A.020 and 1990 c 2. 91-01-112, § 51-11-0900, filed 12/19/90, effective 7/1/91.]

Reviser's note: The brackets and enclosed material in the text of the above section occurred in the copy filed by the agency.

Reviser's note: Notice of Objection: The Joint Administrative Rules Review Committee (Committee) finds that, in adopting the 2009 proposed changes to the State Energy Code, Chapter 51-11 WAC, on November 20, 2009, the State Building Code Council (Council) failed to comply with all requirements of the law and failed to adequately respond to the Committee's request for additional economic impact and cost-benefit analyses prior to adoption.

On October 1, 2009, the Committee found that the Small Business Economic Impact Statement (SBEIS) for the proposed changes filed with the Code Reviser failed to comply with all requirements of law. The Committee requested that the Council conduct a cost-benefit analysis pursuant to RCW 34.05.328 and amend the SBEIS to provide additional economic impact information, including an estimate of the number of jobs that would be created or lost as a result of compliance with all the proposed rules, as required by RCW 19.85.040 (2)(d).

The Council provided the Committee with information and data on November 18, 2009. On December 2, 2009, the Committee found that the Council failed to adequately respond to the Committee's request for additional data. Specifically, the Committee found that the Council failed to amend the SBEIS to (a) estimate the number of jobs that would be created or lost as a result of compliance with the proposed changes; and (b) support the SBEIS with a detailed and rigorous costs analysis of the cumulative impact of all the changes. In addition, the Committee found that the Council failed to provide the Committee with a cost-benefit analysis of the proposed changes and pursuant to the requirements of RCW 34.05.328.

The Committee strongly supports a process that makes thoughtful and informed progress towards changes that result in improved energy efficiency in our buildings, wherever practicable. While the Council worked diligently, it is the opinion of the Committee that the Council did not fully develop and consider the economic impacts and costs versus benefits of these significant changes to our Energy Code. Furthermore, it is the opinion of the Committee that the Council and the Legislature need this information to fully evaluate the value, impacts, and consequences of the proposed codes, with due diligence to their respective fiduciary responsibilities, in order to create the best informed public policy.

As a result, the Committee recommends that the Governor suspend the adoption and implementation of the changes to the Energy Code, Chapter 51-11 WAC, adopted by the Council on November 20, 2009, until such time as a more adequate analysis has been completed and considered by the appropriate bodies.

For all of the above stated reasons, the Committee objects to the changes to the State Energy Code, Chapter 51-11 WAC, that were adopted by the Council on November 20, 2009, and hereby directs the Code Reviser, pursuant to RCW 34.05.640(4), to publish this Notice of Objection in the Washington State Register and along with any publication in the Washington Administrative Code of changes to Chapter 51-11 WAC that were adopted by the Council in 2009 and filed with the Code Reviser.

WAC 51-11-1001 Section 1001 General.

1001.1 Scope: The following defaults shall apply to Chapters 1 through 20. This chapter includes tables of seasonal average heat-loss coefficients for specified nominal insulation. The heat-loss coefficients may also be used for heating system sizing.

1001.2 Description: These coefficients were developed primarily from data and procedures from Standard RS-1, and taken specifically from Standard RS-2, listed in Chapter 7.

Coefficients not contained in this chapter may be computed using the procedures listed in these references if the assumptions in the following sections and Standard RS-2, listed in Chapter 7, are used, along with data from the sources referenced above.

1001.3 **Air Films:** Default R-values used for air films shall be as follows:

R-Value	Condition
0.17	All exterior surfaces
0.61	Interior horizontal surfaces, heat flow up
0.92	Interior horizontal surfaces, heat flow down
0.68	Interior vertical surfaces

1001.4 **Compression of Insulation:** Insulation which is compressed shall be rated in accordance with Table 10-A or reduction in value may be calculated in accordance with the procedures in Standard RS-1, listed in Chapter 7.

TABLE 10-A
R-Value of Fiberglass Batts Compressed within Various Depth Cavities

Insulation R-Value at Standard Thickness													
Rated R-Value		**82**	**71**	**60**	**49**	**38**	**30**	**22**	**21**	**19**	**15**	**13**	**11**
Standard Thickness, Inches		**26.0**	**22.5**	**19.0**	**15.5**	**12**	**9.5**	**6.5**	**5.5**	**6**	**3.5**	**3.5**	**3.5**
Nominal Lumber Sizes, Inches	Actual Depth of Cavity, Inches	Insulation R-Values when Installed in a Confined Cavity											
Truss	26.0	82	—	—	—	—	—	—	—	—	—	—	—
Truss	22.5	—	71	—	—	—	—	—	—	—	—	—	—
Truss	19.0	—	—	60	—	—	—	—	—	—	—	—	—
Truss	15.5	—	—	—	49	—	—	—	—	—	—	—	—
Truss	12.0	—	—	—	—	38	—	—	—	—	—	—	—
2 x 12	11.25	—	—	—	—	37	—	—	—	—	—	—	—
2 x 10	9.25	—	—	—	—	32	30	—	—	—	—	—	—
2 x 8	7.25	—	—	—	—	27	26	22	21	19	—	—	—
2 x 6	5.5	—	—	—	—	—	21	20	21	18	—	—	—
2 x 4	3.5	—	—	—	—	—	—	14	—	13	15	13	11
	2.5	—	—	—	—	—	—	—	—	—	—	9.8	—
	1.5	—	—	—	—	—	—	—	—	—	—	6.3	6.0

[Statutory Authority: RCW 19.27A.025, 19.27A.045. 10-03-115, 10-13-113 and 10-22-056, § 51-11-1001, filed 1/20/10, 6/21/10 and 10/28/10, effective 1/1/11. Statutory Authority: RCW 19.27A.020, 19.27A.045. 04-01-106, § 51-11-1001, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27A.025, 19.27A.045. 01-03-010, § 51-11-1001, filed 1/5/01, effective 7/1/01. Statutory Authority: RCW 19.27A.020 and 1990 c 2. 91-01-112, § 51-11-1001, filed 12/19/90, effective 7/1/91.]

Reviser's note: Notice of Objection: The Joint Administrative Rules Review Committee (Committee) finds that, in adopting the 2009 proposed changes to the State Energy Code, Chapter 51-11 WAC, on November 20, 2009, the State Building Code Council (Council) failed to comply with all requirements of the law and failed to adequately respond to the Committee's request for additional economic impact and cost-benefit analyses prior to adoption.

On October 1, 2009, the Committee found that the Small Business Economic Impact Statement (SBEIS) for the proposed changes filed with the Code Reviser failed to comply with all requirements of law. The Committee requested that the Council conduct a cost-benefit analysis pursuant to RCW 34.05.328 and amend the SBEIS to provide additional economic impact information, including an estimate of the number of jobs that would be created or lost as a result of compliance with all the proposed rules, as required by RCW 19.85.040 (2)(d).

The Council provided the Committee with information and data on November 18, 2009. On December 2, 2009, the Committee found that the Council failed to adequately respond to the Committee's request for additional data. Specifically, the Committee found that the Council failed to amend the SBEIS to (a) estimate the number of jobs that would be created or lost as a result of compliance with the proposed changes; and (b) support the SBEIS with a detailed and rigorous costs analysis of the cumulative impact of all the changes. In addition, the Committee found that the Council failed to provide the Committee with a cost-benefit analysis of the proposed changes and pursuant to the requirements of RCW 34.05.328.

The Committee strongly supports a process that makes thoughtful and informed progress towards changes that result in improved energy efficiency in our buildings, wherever practicable. While the Council worked diligently, it is the opinion of the Committee that the Council did not fully develop and consider the economic impacts and costs versus benefits of these significant changes to our Energy Code. Furthermore, it is the opinion of the Committee that the Council and the Legislature need this information to fully evaluate the value, impacts, and consequences of the proposed codes, with due diligence to their respective fiduciary responsibilities, in order to create the best informed public policy.

As a result, the Committee recommends that the Governor suspend the adoption and implementation of the changes to the Energy Code, Chapter 51-11 WAC, adopted by the Council on November 20, 2009, until such time as a more adequate analysis has been completed and considered by the appropriate bodies.

For all of the above stated reasons, the Committee objects to the changes to the State Energy Code, Chapter 51-11 WAC, that were adopted by the Council on November 20, 2009, and hereby directs the Code Reviser, pursuant to RCW 34.05.640(4), to publish this Notice of Objection in the Washington State Register and along with any publication in the Washington Administrative Code of changes to Chapter 51-11 WAC that were adopted by the Council in 2009 and filed with the Code Reviser.

WAC 51-11-1004 Section 1004: Floors over unconditioned space.

1004.1 General: Tables 10-3, 10-4 and 10-4a list heat-loss coefficients for floors over unconditioned spaces in units of Btu/h•ft²•°F.

They are derived from procedures listed in RS-1, listed in Chapter 7, assuming an average outdoor temperature of 45°F, an average indoor temperature of 65°F, and a crawlspace area of 1350 ft² and 100 ft of perimeter. The crawlspace is assumed to be 2.5 feet high, with 24 inches below grade and 6 inches above grade.

1004.2 Crawlspace Description: Four configurations are considered: Naturally ventilated crawlspace, mechanically ventilated crawlspace, heated plenum crawlspace and exposed floor.

Naturally ventilated crawlspaces: Assumed to have 3.0 air-changes per hour, with at least 1.0 ft² of net-free ventilation in the foundation for every three hundred ft² of crawlspace floor area. The crawlspace is not actively heated.

Floors over unheated areas, such as garages, may only use those values which have R-0 perimeter insulation.

Mechanically ventilated crawlspaces: Assumed to have 1.5 air changes per hour, with less than 1.0 ft² of net-free ventilation in the foundation for every three hundred ft² of crawlspace floor area. The crawlspace is not actively heated. Floors over unheated basements may only use those values which have R-0 perimeter insulation.

Heated-plenum crawlspaces: Assumed to have 0.25 air-changes per hour, with no foundation vents. Heated supply air from central furnace is blown into a crawlspace and allowed to enter the living space unducted via holes cut into the floor.

Enclosed floors: Assumes no buffer space, and a covering of one-half inch of T1-11 on the exterior of the cavity exposed to the outside air or rigid insulation below a concrete floor, such as over parking garages.

1004.3 Construction Description: Floors are assumed to be either joisted floors framed on sixteen inch centers, or post and beam on four by eight foot squares. Insulation is assumed to be installed under the subflooring between the joists or beams with no space between the insulation and the subfloor. Insulation is assumed to be uncompressed. Exposed floors also include concrete with continuous rigid insulation assumed.

Perimeter insulation is assumed to extend from the top of the rim joist to the crawlspace floor and then inward along the ground (on top of the ground cover) for at least twenty-four inches.

Floor coverings are assumed to be light carpet with rubber pad.

TABLE 10-3
DEFAULT U-FACTORS FOR FLOORS OVER VENTED CRAWLSPACE OR UNHEATED BASEMENT

Nominal R-value		U-factor	
Floor	Perimeter	Post & Beam	Joists
0	0	0.112	0.134
	11	0.100	0.116
	19	0.098	0.114
	30	0.093	0.107
11	0	0.052	0.056
	11	0.048	0.052
19	0	0.038	0.041
	11	0.036	0.038
22	0	0.034	0.037
	11	0.033	0.035
25	0	0.032	0.034
	11	0.031	0.033

Nominal R-value		U-factor	
Floor	Perimeter	Post & Beam	Joists
30	0	0.028	0.029
	11	0.027	0.028
38	0	0.024	0.025
	11	0.024	0.024

TABLE 10-4
DEFAULT U-FACTORS FOR FLOORS OVER HEATED PLENUM CRAWLSPACES

Nominal R-value Perimeter	U-factor
11	0.085
19	0.075
30	0.069

TABLE 10-4A
EXPOSED FLOOR

Nominal	U-factor		
R-value	Concrete	Wood Joist	Metal Joist
R-11	0.077	0.088	0.14
R-15	0.059	0.076	0.12
R-19	0.048	0.062	0.11
R-21	0.043	0.057	0.11
R-25	0.037	0.051	0.10
R-30	0.031	0.040	0.09
R-38	0.025	0.034	0.08

Note: Crawlspaces used as heated plenums have approximately 30% higher heat-loss rate than unvented crawlspaces with the same assumed ACH. Default U-values in Table 10-4 reflect this higher rate of heat loss.

[Statutory Authority: RCW 19.27A.025, 19.27A.045. 10-03-115, 10-13-113 and 10-22-056, § 51-11-1004, filed 1/20/10, 6/21/10 and 10/28/10, effective 1/1/11. Statutory Authority: RCW 19.27A.020, 19.27A.045. 04-01-106, § 51-11-1004, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27A.025, 19.27A.045. 01-03-010, § 51-11-1004, filed 1/5/01, effective 7/1/01; 98-03-003, § 51-11-1004, filed 1/8/98, effective 7/1/98. Statutory Authority: RCW 19.27A.020 and 1990 c 2. 91-01-112, § 51-11-1004, filed 12/19/90, effective 7/1/91.]

Reviser's note: Notice of Objection: The Joint Administrative Rules Review Committee (Committee) finds that, in adopting the 2009 proposed changes to the State Energy Code, Chapter 51-11 WAC, on November 20, 2009, the State Building Code Council (Council) failed to comply with all requirements of the law and failed to adequately respond to the Committee's request for additional economic impact and cost-benefit analyses prior to adoption.

On October 1, 2009, the Committee found that the Small Business Economic Impact Statement (SBEIS) for the proposed changes filed with the Code Reviser failed to comply with all requirements of law. The Committee requested that the Council conduct a cost-benefit analysis pursuant to RCW 34.05.328 and amend the SBEIS to provide additional economic impact information, including an estimate of the number of jobs that would be created or lost as a result of compliance with all the proposed rules, as required by RCW 19.85.040 (2)(d).

The Council provided the Committee with information and data on November 18, 2009. On December 2, 2009, the Committee found that the Council failed to adequately respond to the Committee's request for additional data. Specifically, the Committee found that the Council failed to amend the SBEIS to (a) estimate the number of jobs that would be created or lost as a result of compliance with the proposed changes; and (b) support the SBEIS with a detailed and rigorous costs analysis of the cumulative impact of all the changes. In addition, the Committee found that the Council failed to provide the Committee with a cost-benefit analysis of the proposed changes and pursuant to the requirements of RCW 34.05.328.

The Committee strongly supports a process that makes thoughtful and informed progress towards changes that result in improved energy efficiency in our buildings, wherever practicable. While the Council worked diligently, it is the opinion of the Committee that the Council did not fully develop and consider the economic impacts and costs versus benefits of these significant changes to our Energy Code. Furthermore, it is the opinion of the Committee that the Council and the Legislature need this information to fully evaluate the value, impacts, and consequences of the proposed codes, with due diligence to their respective fiduciary responsibilities, in order to create the best informed public policy.

As a result, the Committee recommends that the Governor suspend the adoption and implementation of the changes to the Energy Code, Chapter 51-11 WAC, adopted by the Council on November 20, 2009, until such time as a more adequate analysis has been completed and considered by the appropriate bodies.

For all of the above stated reasons, the Committee objects to the changes to the State Energy Code, Chapter 51-11 WAC, that were adopted by the Council on November 20, 2009, and hereby directs the Code Reviser, pursuant to RCW 34.05.640(4), to publish this Notice of Objection in the Washington State Register and along with any publication in the Washington Administrative Code of changes to Chapter 51-11 WAC that were adopted by the Council in 2009 and filed with the Code Reviser.

WAC 51-11-1005 Section 1005: Above-grade walls.

Section 1005.1 General: Table 10-5, 10-5A and 10-5B list heat-loss coefficients for the opaque portion of above-grade wood stud frame walls, metal stud frame walls and concrete masonry walls (Btu/h•ft²•°F) respectively. They are derived from procedures listed in RS-1, listed in Chapter 7. For intermediate floor slabs which penetrate the insulated wall, use the concrete wall U-factors in Table 10-5B.

Insulation is assumed to uniformly fill the entire cavity and to be installed as per manufacturer's directions. All walls are assumed to be finished on the inside with one-half inch gypsum wallboard, and on the outside with either beveled wood siding over one-half inch plywood sheathing or with five-eighths inch T1-11 siding. Insulated sheathing (either interior or exterior) is assumed to cover the entire opaque wall surface.

Metal building walls have a different construction and are addressed in Table 10-5A(3).

1005.2 Framing Description: For wood stud frame walls, three framing types are considered, and defined as follows:

Standard: Studs framed on sixteen inch centers with double top plate and single bottom plate. Corners use three studs and each opening is framed using two studs. Headers consist of double 2X or single 4X material with an air space left between the header and the exterior sheathing. Interior partition wall/exterior wall intersections use two studs in the exterior wall.

Framing weighting factors:	Studs and plates	.19
	Insulated cavity	.77
	Headers	.04

Intermediate: Studs framed on sixteen inch centers with double top plate and single bottom plate. Corners use two studs or other means of fully insulating corners, and each opening is framed by two studs. Headers consist of double 2X material with R-10 insulation between the header and exterior sheathing. Interior partition wall/exterior wall intersections are fully insulated in the exterior wall.

Framing weighting factors:	Studs and plates	.18
	Insulated cavity	.78
	Headers	.04

Advanced: Studs framed on twenty-four inch centers with double top plate and single bottom plate. Corners use two studs or other means of fully insulating corners, and one stud is used to support each header. Headers consist of double 2X material with R-10 insulation between the header and exterior sheathing. Interior partition wall/exterior wall intersections are fully insulated in the exterior wall.

Framing weighting factors:	Studs and plates	.13
	Insulated cavity	.83
	Headers	.04

1005.3 Component Description: Default coefficients for the following types of walls are listed: Single-stud walls, strap walls, double-stud walls, log walls, stress-skin panels, metal stud walls, and metal building walls.

Single-Stud Wall, Tables 10-5(1) through 10-5(8): Assumes either 2x4 or 2x6 studs framed on sixteen or twenty-four inch centers. Headers are solid for 2x4 walls and double 2x for 2x6 walls, with either dead-air or rigid-board insulation in the remaining space.

Strap Wall, Table 10-5(9): Assumes 2x6 studs framed on sixteen or twenty-four inch centers. 2x3 or 2x4 strapping is run horizontally along the interior surface of the wall to provide additional space for insulation.

Double-Stud Wall, Tables 10-5(10) and 10-5(11): Assumes an exterior structural wall and a separate interior, nonstructural wall. Insulation is placed in both wall cavities and in the space between the 2 walls. Stud spacing is assumed to be on 24 inch centers for both walls.

Log Wall, Table 10-5(12).

Stress-Skin Panel, Table 10-5(13).

Metal Stud Wall, Overall Assembly U-Factors, Table 10-5A(1): Assumes metal studs spaced on 16- or 24-inch centers with insulation installed to fill wall cavities. Continuous rigid board insulation is applied without creating uninsulated voids in the wall assembly.

Metal Stud Wall, Effective R-Values for Metal Framing and Cavity Only, Table 10-5A(2): These values may be used for the metal-framing/cavity layers in walls with metal studs spaced on 16- or 24-inch centers with insulation installed to fill wall cavities in lieu of using the zone method provided in Chapter 25 of Standard RS-1 listed in Chapter 7.

Metal Building Wall, Table 10-5A(3): A wall whose structure consists of metal spanning panels supported by steel structural members (does not include spandrel glass or metal panels in curtain wall systems). The first nominal R-value is for insulation compressed between metal wall panels and the steel structure. For double-layer installations, the second rated R-value of insulation is for insulation installed from the inside, covering the girts. For continuous insulation (e.g., insulation boards) it is assumed that the insulation boards are installed on the inside of the girts and uninterrupted by the framing members. Insulation exposed to the conditioned space or semiheated space shall have a facing, and all insulation seams shall be continuously sealed to provide a continuous air barrier.

Concrete and Masonry Walls, Table 10-5B(1).

Peripheral Edges of Intermediate Concrete Floors, Table 10-5B(2).

TABLE 10-5
DEFAULT U-FACTORS FOR ABOVE-GRADE WALLS

TABLE 10-5(1)
2 x 4 Single Wood Stud: R-11 Batt

NOTE:
Nominal Batt R-value:
R-11 at 3.5 inch thickness

Installed Batt R-value:
R-11 in 3.5 inch cavity

Siding Material/Framing Type				
	Lapped Wood		T1-11	
R-value of Foam Board	STD	ADV	STD	ADV
0	0.088	0.084	0.094	0.090
1	0.080	0.077	0.085	0.082
2	0.074	0.071	0.078	0.075
3	0.069	0.066	0.072	0.070
4	0.064	0.062	0.067	0.065
5	0.060	0.058	0.063	0.061
6	0.056	0.055	0.059	0.057
7	0.053	0.052	0.055	0.054
8	0.051	0.049	0.052	0.051
9	0.048	0.047	0.050	0.049
10	0.046	0.045	0.047	0.046
11	0.044	0.043	0.045	0.044
12	0.042	0.041	0.043	0.042

TABLE 10-5(2)

2 x 4 Single Wood Stud: R-13 Batt

Siding Material/Framing Type				
	Lapped Wood		T1-11	
R-value of Foam Board	STD	ADV	STD	ADV
0	0.082	0.078	0.088	0.083
1	0.075	0.072	0.080	0.076
2	0.069	0.066	0.073	0.070
3	0.065	0.062	0.068	0.065
4	0.060	0.058	0.063	0.061
5	0.057	0.055	0.059	0.057
6	0.053	0.052	0.056	0.054
7	0.051	0.049	0.052	0.051
8	0.048	0.047	0.050	0.048
9	0.046	0.045	0.047	0.046
10	0.044	0.043	0.045	0.044
11	0.042	0.041	0.043	0.042
12	0.040	0.039	0.041	0.040

NOTE:
Nominal Batt R-value:
R-13 at 3.63 inch thickness

Installed Batt R-value:
R-12.7 in 3.5 inch cavity

TABLE 10-5(3)

2 x 4 Single Wood Stud: R-15 Batt

Siding Material/Framing Type				
	Lapped Wood		T1-11	
R-value of Foam Board	STD	ADV	STD	ADV
0	0.076	0.071	0.081	0.075
1	0.069	0.065	0.073	0.069
2	0.064	0.061	0.068	0.069
3	0.060	0.057	0.063	0.059
4	0.056	0.053	0.059	0.056
5	0.053	0.051	0.055	0.052
6	0.050	0.048	0.052	0.050
7	0.047	0.046	0.049	0.047
8	0.045	0.044	0.047	0.045
9	0.043	0.042	0.044	0.043
10	0.041	0.040	0.042	0.041
11	0.039	0.038	0.041	0.039
12	0.038	0.037	0.039	0.038

NOTE:

Nominal Batt R-value:
R-15 at 3.5 inch thickness

Installed Batt R-value:
R-15 in 3.5 inch cavity

TABLE 10-5(4)

2 x 6 Single Wood Stud: R-19 Batt

Siding Material/Framing Type						
	Lapped Wood			T1-11		
R-value of FoamBoard	STD	INT	ADV	STD	INT	ADV
0	0.062	0.058	0.055	0.065	0.061	0.058
1	0.058	0.055	0.052	0.060	0.057	0.055
2	0.054	0.052	0.050	0.056	0.054	0.051
3	0.051	0.049	0.047	0.053	0.051	0.049
4	0.048	0.046	0.045	0.050	0.048	0.046
5	0.046	0.044	0.043	0.048	0.046	0.044
6	0.044	0.042	0.041	0.045	0.044	0.042
7	0.042	0.040	0.039	0.043	0.042	0.040
8	0.040	0.039	0.038	0.041	0.040	0.039
9	0.038	0.037	0.035	0.039	0.038	0.037
10	0.037	0.036	0.035	0.038	0.037	0.036
11	0.036	0.035	0.034	0.036	0.035	0.035
12	0.034	0.033	0.033	0.035	0.034	0.033

NOTE:
Nominal Batt R-value:
R-19 at 6 inch thickness

Installed Batt R-value:
R-18 in 5.5 inch cavity

TABLE 10-5(5)

2 x 6 Single Wood Stud: R-21 Batt

Siding Material/Framing Type						
	Lapped Wood			T1-11		
R-value of FoamBoard	STD	INT	ADV	STD	INT	ADV
0	0.057	0.054	0.051	0.060	0.056	0.053
1	0.054	0.051	0.048	0.056	0.053	0.050
2	0.050	0.048	0.045	0.052	0.050	0.047
3	0.048	0.045	0.043	0.049	0.047	0.045
4	0.045	0.043	0.041	0.047	0.045	0.043
5	0.043	0.041	0.040	0.044	0.042	0.041
6	0.041	0.039	0.038	0.042	0.041	0.039
7	0.039	0.038	0.036	0.040	0.039	0.037
8	0.038	0.036	0.035	0.039	0.037	0.036
9	0.036	0.035	0.034	0.037	0.036	0.035
10	0.035	0.034	0.033	0.036	0.035	0.033
11	0.033	0.033	0.032	0.034	0.033	0.032
12	0.032	0.031	0.031	0.033	0.032	0.031

NOTE:
Nominal Batt R-value:
R-21 at 5.5 inch thickness

Installed Batt R-value:
R-21 in 5.5 inch cavity

TABLE 10-5(6)

2 x 6 Single Wood Stud: R-22 Batt

Siding Material/Framing Type						
	Lapped Wood			T1-11		
R-value of Foam Board	STD	INT	ADV	STD	INT	ADV
0	0.059	0.055	0.052	0.062	0.058	0.054
1	0.055	0.052	0.049	0.057	0.054	0.051
2	0.052	0.049	0.047	0.054	0.051	0.048
3	0.049	0.046	0.044	0.050	0.048	0.046
4	0.046	0.044	0.042	0.048	0.046	0.044
5	0.044	0.042	0.041	0.045	0.043	0.042
6	0.042	0.040	0.039	0.043	0.042	0.040
7	0.040	0.039	0.037	0.041	0.040	0.038
8	0.038	0.037	0.036	0.039	0.038	0.037
9	0.037	0.036	0.035	0.038	0.037	0.035
10	0.035	0.034	0.033	0.036	0.035	0.034
11	0.034	0.033	0.032	0.035	0.034	0.033
12	0.033	0.032	0.031	0.034	0.033	0.032

NOTE:
Nominal Batt R-value:
R-22 at 6.75 inch thickness

Installed Batt R-value:
R-20 in 5.5 inch cavity

TABLE 10-5(7)

2 x 6 Single Wood Stud: Two R-11 Batts

Siding Material/Framing Type						
	Lapped Wood			T1-11		
R-value of Foam Board	STD	INT	ADV	STD	INT	ADV
0	0.060	0.057	0.054	0.063	0.059	0.056
1	0.056	0.053	0.051	0.059	0.056	0.053
2	0.053	0.050	0.048	0.055	0.052	0.050
3	0.050	0.048	0.046	0.052	0.049	0.047
4	0.047	0.045	0.044	0.049	0.047	0.045
5	0.045	0.043	0.042	0.046	0.045	0.043
6	0.043	0.041	0.040	0.044	0.043	0.041
7	0.041	0.040	0.038	0.042	0.041	0.039
8	0.039	0.038	0.037	0.040	0.039	0.038
9	0.038	0.037	0.036	0.039	0.038	0.036
10	0.036	0.035	0.034	0.037	0.036	0.035
11	0.035	0.034	0.033	0.036	0.035	0.034
12	0.034	0.033	0.032	0.034	0.034	0.033

NOTE:
Nominal Batt R-value:
R-22 at 7 inch thickness

Installed Batt R-value:
R-18.9 in 5.5 inch cavity

TABLE 10-5(8)

2 x 8 Single Stud: R-25 Batt

NOTE:
Nominal Batt R-value:
R-25 at 8 inch thickness

Installed Batt R-value:
R-23.6 in 7.25 inch cavity

Siding Material/Framing Type						
	Lapped Wood			T1-11		
R-value of Foam Board	STD	INT	ADV	STD	INT	ADV
0	0.051	0.047	0.045	0.053	0.049	0.046
1	0.048	0.045	0.043	0.049	0.046	0.044
2	0.045	0.043	0.041	0.047	0.044	0.042
3	0.043	0.041	0.039	0.044	0.042	0.040
4	0.041	0.039	0.037	0.042	0.040	0.038
5	0.039	0.037	0.036	0.040	0.038	0.037
6	0.037	0.036	0.035	0.038	0.037	0.036
7	0.036	0.035	0.033	0.037	0.035	0.034
8	0.035	0.033	0.032	0.035	0.034	0.033
9	0.033	0.032	0.031	0.034	0.033	0.032
10	0.032	0.031	0.030	0.033	0.032	0.031
11	0.031	0.030	0.029	0.032	0.031	0.030
12	0.030	0.029	0.028	0.031	0.030	0.029

TABLE 10-5(9)

2 x 6: Strap Wall				
	Siding Material/Frame Type			
	Lapped Wood		T1-11	
	STD	ADV	STD	ADV
R-19 +R-11 Batts	0.036	0.035	0.038	0.036
R-19 +R-8 Batts	0.041	0.039	0.042	0.040

TABLE 10-5(10)

2 x 6 + 2 x 4: Double Wood Stud

Batt Configuration			Siding Material/Frame Type			
			Lapped Wood		T1-11	
Exterior	Middle	Interior	STD	ADV	STD	ADV
R-19	———	R-11	0.040	0.037	0.041	0.038
R-19	———	R-19	0.034	0.031	0.035	0.032
R-19	R-8	R-11	0.029	0.028	0.031	0.029
R-19	R-11	R-11	0.027	0.026	0.028	0.027
R-19	R-11	R-19	0.024	0.023	0.025	0.023
R-19	R-19	R-19	0.021	0.020	0.021	0.020

TABLE 10-5(11)

2 x 4 + 2 x 4: Double Wood Stud						
Batt Configuration			Siding Material/Frame Type			
			Lapped Wood		T1-11	
Exterior	Middle	Interior	STD	ADV	STD	ADV
R-11	———	R-11	0.050	0.046	0.052	0.048
R-19	———	R-11	0.039	0.037	0.043	0.039
R-11	R-8	R-11	0.037	0.035	0.036	0.036
R-11	R-11	R-11	0.032	0.031	0.033	0.032
R-13	R-13	R-13	0.029	0.028	0.029	0.028
R-11	R-19	R-11	0.026	0.026	0.027	0.026

TABLE 10-5(12)

Log Walls

Average Log Diameter, Inches	U-factor
6	0.148
8	0.111
10	0.089
12	0.074
14	0.063
16	0.056

R-value of wood:
R-1.25 per inch thickness

Average wall thickness
90% average log diameter

TABLE 10-5(13)

Stress Skin Panel

Panel Thickness, Inches	U-factor
3 1/2	0.071
5 1/2	0.048
7 1/4	0.037
9 1/4	0.030
11 1/4	0.025

R-value of expanded polystyrene: R-3.85 per inch

Framing: 6%
Spline: 8%
No thermal bridging between interior and exterior splines

Metal Stud Walls: The nominal R-values in Table 10-5A may be used for purposes of calculating metal stud wall section U-factors in lieu of the ASHRAE zone calculation method as provided in Chapter 27 of Standard RS-1.

TABLE 10-5A

Default U-factors for Overall Assembly Metal Stud Walls, Effective R-values for Metal Framing and Cavity Only, and Default Metal Building U-factors

TABLE 10-5A(1)
OVERALL ASSEMBLY U-FACTORS FOR METAL STUD WALLS

Metal Framing	R-Value of Continuous Foam Board Insulation	Cavity Insulation					
		R-0	R-11	R-13	R-15	R-19	R-21
16" o.c.	R-0 (none)	U-0.352	U-0.132	U-0.124	U-0.118	U-0.109	U-0.106
	R-1	U-0.260	U-0.117	U-0.111	U-0.106	U-0.099	U-0.096
	R-2	U-0.207	U-0.105	U-0.100	U-0.096	U-0.090	U-0.087
	R-3	U-0.171	U-0.095	U-0.091	U-0.087	U-0.082	U-0.080
	R-4	U-0.146	U-0.087	U-0.083	U-0.080	U-0.076	U-0.074
	R-5	U-0.128	U-0.080	U-0.077	U-0.074	U-0.071	U-0.069
	R-6	U-0.113	U-0.074	U-0.071	U-0.069	U-0.066	U-0.065
	R-7	U-0.102	U-0.069	U-0.066	U-0.065	U-0.062	U-0.061
	R-8	U-0.092	U-0.064	U-0.062	U-0.061	U-0.058	U-0.057
	R-9	U-0.084	U-0.060	U-0.059	U-0.057	U-0.055	U-0.054
	R-10	U-0.078	U-0.057	U-0.055	U-0.054	U-0.052	U-0.051
	R-11	U-0.072	U-0.054	U-0.052	U-0.051	U-0.050	U-0.049
	R-12	U-0.067	U-0.051	U-0.050	U-0.049	U-0.047	U-0.047
	R-13	U-0.063	U-0.049	U-0.048	U-0.047	U-0.045	U-0.045
	R-14	U-0.059	U-0.046	U-0.045	U-0.045	U-0.043	U-0.043
	R-15	U-0.056	U-0.044	U-0.043	U-0.043	U-0.041	U-0.041
	R-20	U-0.044	U-0.036	U-0.036	U-0.035	U-0.034	U-0.034
24" o.c	R-0 (none)	U-0.338	U-0.116	U-0.108	U-0.102	U-0.094	U-0.090
	R-1	U-0.253	U-0.104	U-0.098	U-0.092	U-0.086	U-0.083
	R-2	U-0.202	U-0.094	U-0.089	U-0.084	U-0.079	U-0.077

	R-3	U-0.168	U-0.086	U-0.082	U-0.078	U-0.073	U-0.071
	R-4	U-0.144	U-0.079	U-0.075	U-0.072	U-0.068	U-0.066
	R-5	U-0.126	U-0.073	U-0.070	U-0.067	U-0.064	U-0.062
	R-6	U-0.112	U-0.068	U-0.066	U-0.063	U-0.060	U-0.059
	R-7	U-0.100	U-0.064	U-0.062	U-0.059	U-0.057	U-0.055
	R-8	U-0.091	U-0.060	U-0.058	U-0.056	U-0.054	U-0.052
	R-9	U-0.084	U-0.057	U-0.055	U-0.053	U-0.051	U-0.050
	R-10	U-0.077	U-0.054	U-0.052	U-0.050	U-0.048	U-0.048
	R-11	U-0.072	U-0.051	U-0.049	U-0.048	U-0.046	U-0.045
	R-12	U-0.067	U-0.048	U-0.047	U-0.046	U-0.044	U-0.043
	R-13	U-0.063	U-0.046	U-0.045	U-0.044	U-0.042	U-0.042
	R-14	U-0.059	U-0.044	U-0.043	U-0.042	U-0.041	U-0.040
	R-15	U-0.056	U-0.042	U-0.041	U-0.040	U-0.039	U-0.038
	R-20	U-0.044	U-0.035	U-0.034	U-0.034	U-0.033	U-0.032

Footnote: Continuous foam board insulation: Continuous insulation assumes no thermal bridging of insulation by framing or z-furring through applied foam board. Zone calculation method as provided in RS-1 must be used for thermally bridged foam board insulation.

TABLE 10-5A(2)
EFFECTIVE R-VALUES FOR METAL FRAMING AND CAVITY ONLY

	Cavity		Insulation		
	Nominal Depth, Inches	Actual Depth, Inches	Nominal R-Value	Effective R-Value	
				16" O.C.	24" O.C.
Air Cavity	any	any	R-0.91 (air)	0.79	0.91
Wall	4	3-1/2	R-11	5.5	6.6
	4	3-1/2	R-13	6.0	7.2
	4	3-1/2	R-15	6.4	7.8
	6	5-1/2	R-19	7.1	8.6
	6	5-1/2	R-21	7.4	9.0
	8	7-1/4	R-25	7.8	9.6
Roof		Insulation is uncompressed	R-11	5.5	6.1
			R-19	7.0	9.1
			R-30	9.3	11.4

TABLE 10-5A(3)
DEFAULT METAL BUILDING WALL U-FACTORS

Insulation System	Rated R-Value of Insulation	Overall U-Factor for Entire Base Wall Assembly	Overall U-Factor for Assembly of Base Wall Plus Continuous Insulation (Uninterrupted by Framing)					
Single Layer of Mineral Fiber			R-6.5	R-13	R-19.5	R-26	R-32.5	R-39
	None	1.180	0.136	0.072	0.049	0.037	0.030	0.025
	R-10	0.186	0.084	0.054	0.040	0.032	0.026	0.023
	R-11	0.185	0.084	0.054	0.040	0.032	0.026	0.023
	R-13	0.162	0.079	0.052	0.039	0.031	0.026	0.022
	R-16	0.155	0.077	0.051	0.039	0.031	0.026	0.022
	R-19	0.147	0.075	0.050	0.038	0.030	0.025	0.022

Concrete Masonry Walls: The nominal R-values in Table 10-5B may be used for purposes of calculating concrete masonry wall section U-factors in lieu of the ASHRAE isothermal planes calculation method as provided in Chapter 27 of Standard RS-1.

TABLE 10-5B(1)
Default U-Factors for Concrete and Masonry Walls

8" CONCRETE MASONRY				
	CORE TREATMENT			
	Partial Grout with Ungrouted Cores			
		Loose-fill insulated		
WALL DESCRIPTION	Empty	Perlite	Vermiculite	Solid Grout
Exposed Block, Both Sides	0.40	0.23	0.24	0.43
R-5 Interior Insulation, Wood Furring	0.14	0.11	0.12	0.15
R-6 Interior Insulation, Wood Furring	0.14	0.11	0.11	0.14
R-10.5 Interior Insulation, Wood Furring	0.11	0.09	0.09	0.11
R-8 Interior Insulation, Metal Clips	0.11	0.09	0.09	0.11
R-6 Exterior Insulation	0.12	0.10	0.10	0.12
R-10 Exterior Insulation	0.08	0.07	0.07	0.08
R-9.5 Rigid Polystyrene Integral Insulation, Two Webbed Block	0.11	0.09	0.09	0.12

12" CONCRETE MASONRY				
	CORE TREATMENT			
	Partial Grout with Ungrouted Cores			
		Loose-fill insulated		
	Empty	Perlite	Vermiculite	Solid Grout
Exposed Block, Both Sides	0.35	0.17	0.18	0.33
R-5 Interior Insulation, Wood Furring	0.14	0.10	0.10	0.13
R-6 Interior Insulation, Wood Furring	0.13	0.09	0.10	0.13
R-10.5 Interior Insulation, Wood Furring	0.11	0.08	0.08	0.10
R-8 Interior Insulation, Metal Clips	0.10	0.08	0.08	0.09
R-6 Exterior Insulation	0.11	0.09	0.09	0.11
R-10 Exterior Insulation	0.08	0.06	0.06	0.08
R-9.5 Rigid Polystyrene Integral Insulation, Two Webbed Block	0.11	0.08	0.09	0.12

8" CLAY BRICK				
WALL DESCRIPTION	CORE TREATMENT			
	Partial Grout with Ungrouted Cores			
		Loose-fill insulated		
	Empty	Perlite	Vermiculite	Solid Grout
Exposed Block, Both Sides	0.50	0.31	0.32	0.56
R-5 Interior Insulation, Wood Furring	0.15	0.13	0.13	0.16
R-6 Interior Insulation, Wood Furring	0.15	0.12	0.12	0.15
R-10.5 Interior Insulation, Wood Furring	0.12	0.10	0.10	0.12
R-8 Interior Insulation, Metal Clips	0.11	0.10	0.10	0.11
R-6 Exterior Insulation	0.12	0.11	0.11	0.13
R-10 Exterior Insulation	0.08	0.08	0.08	0.09

6" CONCRETE POURED OR PRECAST				
WALL DESCRIPTION	CORE TREATMENT			
	Partial Grout with Ungrouted Cores			
		Loose-fill insulated		
	Empty	Perlite	Vermiculite	Solid Grout
Exposed Concrete, Both Sides	NA	NA	NA	0.61
R-5 Interior Insulation, Wood Furring	NA	NA	NA	0.16
R-6 Interior Insulation, Wood Furring	NA	NA	NA	0.15
R-10.5 Interior Insulation, Wood Furring	NA	NA	NA	0.12
R-8 Interior Insulation, Metal Clips	NA	NA	NA	0.12
R-6 Exterior Insulation	NA	NA	NA	0.13
R-10 Exterior Insulation	NA	NA	NA	0.09

Notes for Default Table 10-5B(1)

1. Grouted cores at 40" x 48" on center vertically and horizontally in partial grouted walls.
2. Interior insulation values include 1/2" gypsum board on the inner surface.
3. Furring and stud spacing is 16" on center. Insulation is assumed to fill furring space and is not compressed.
4. Intermediate values may be interpolated using this table. Values not contained in this table may be computed using the procedures listed in Standard RS-1.

TABLE 10-5B(2)
Default U-Factors for Peripheral Edges of Intermediate Concrete Floors

	AVERAGE THICKNESS OF WALL ABOVE AND BELOW			
SLAB EDGE TREATMENT	6 inches	8 inches	10 inches	12 inches
Exposed Concrete	0.816	0.741	0.678	0.625
R-5 Exterior Insulation	0.161	0.157	0.154	0.152
R-6 Exterior Insulation	0.138	0.136	0.134	0.132
R-7 Exterior Insulation	0.122	0.120	0.118	0.116
R-8 Exterior Insulation	0.108	0.107	0.106	0.104
R-9 Exterior Insulation	0.098	0.097	0.095	0.094
R-10 Exterior Insulation	0.089	0.088	0.087	0.086
R-11 Exterior Insulation	0.082	0.081	0.080	0.079
R-12 Exterior Insulation	0.076	0.075	0.074	0.074
R-13 Exterior Insulation	0.070	0.070	0.069	0.068
R-14 Exterior Insulation	0.066	0.065	0.065	0.064
R-15 Exterior Insulation	0.062	0.061	0.061	0.060

[Statutory Authority: RCW 19.27A.025, 19.27A.045. 10-03-115, 10-13-113 and 10-22-056, § 51-11-1005, filed 1/20/10, 6/21/10 and 10/28/10, effective 1/1/11. Statutory Authority: RCW 19.27A.022, 19.27A.025, 19.27A.045, and chapters 19.27 and 34.05 RCW. 07-01-089, § 51-11-1005, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27A.020, 19.27A.045. 04-01-106, § 51-11-1005, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27A.025, 19.27A.045. 01-03-010, § 51-11-1005, filed 1/5/01, effective 7/1/01; 98-03-003, § 51-11-1005, filed 1/8/98, effective 7/1/98. Statutory Authority: RCW 19.27A.020 and 1990 c 2. 91-01-112, § 51-11-1005, filed 12/19/90, effective 7/1/91.]

Reviser's note: Notice of Objection: The Joint Administrative Rules Review Committee (Committee) finds that, in adopting the 2009 proposed changes to the State Energy Code, Chapter 51-11 WAC, on November 20, 2009, the State Building Code Council (Council) failed to comply with all requirements of the law and failed to adequately respond to the Committee's request for additional economic impact and cost-benefit analyses prior to adoption.

On October 1, 2009, the Committee found that the Small Business Economic Impact Statement (SBEIS) for the proposed changes filed with the Code Reviser failed to comply with all requirements of law. The Committee requested that the Council conduct a cost-benefit analysis pursuant to RCW 34.05.328 and amend the SBEIS to provide additional economic impact information, including an estimate of the number of jobs that would be created or lost as a result of compliance with all the proposed rules, as required by RCW 19.85.040 (2)(d).

The Council provided the Committee with information and data on November 18, 2009. On December 2, 2009, the Committee found that the Council failed to adequately respond to the Committee's request for additional data. Specifically, the Committee found that the Council failed to amend the SBEIS to (a) estimate the number of jobs that would be created or lost as a result of compliance with the proposed changes; and (b) support the SBEIS with a detailed and rigorous costs analysis of the cumulative impact of all the changes. In addition, the Committee found that the Council failed to provide the Committee with a cost-benefit analysis of the proposed changes and pursuant to the requirements of RCW 34.05.328.

The Committee strongly supports a process that makes thoughtful and informed progress towards changes that result in improved energy efficiency in our buildings, wherever practicable. While the Council worked diligently, it is the opinion of the Committee that the Council did not fully develop and consider the economic impacts and costs versus benefits of these significant changes to our Energy Code. Furthermore, it is the opinion of the Committee that the Council and the Legislature need this information to fully evaluate the value, impacts, and consequences of the proposed codes, with due diligence to their respective fiduciary responsibilities, in order to create the best informed public policy.

As a result, the Committee recommends that the Governor suspend the adoption and implementation of the changes to the Energy Code, Chapter 51-11 WAC, adopted by the Council on November 20, 2009, until such time as a more adequate analysis has been completed and considered by the appropriate bodies.

For all of the above stated reasons, the Committee objects to the changes to the State Energy Code, Chapter 51-11 WAC, that were adopted by the Council on November 20, 2009, and hereby directs the Code Reviser, pursuant to RCW 34.05.640(4), to publish this Notice of Objection in the Washington State Register and along with any publication in the Washington Administrative Code of changes to Chapter 51-11 WAC that were adopted by the Council in 2009 and filed with the Code Reviser.

WAC 51-11-1006 Section 1006 Default U-factors for glazing and doors.

1006.1 Glazing and Doors without NFRC Certification: Glazing and doors that do not have NFRC certification shall be assigned the following U-factors:

TABLE 10-6
Other than Single-Family Residential: DEFAULT U-FACTORS FOR VERTICAL GLAZING, OVERHEAD GLAZING AND OPAQUE DOORS

Vertical Glazing			
	U-Factor		
	Any Frame	Aluminum W/Thermal Break	Vinyl/Wood/ Fiberglass Frame
Single	1.45	1.45	1.45
Double	0.90	0.85	0.75
1/2 Inch Air, Fixed/Operable	0.75/0.90	0.70/0.84	0.60/0.72
1/2 Inch Air, Low-e(0.40), Fixed/Operable	0.70/0.84	0.60/0.72	0.50/0.60
1/2 Inch Air, Low-e(0.10), Fixed/Operable	0.65/0.78	0.55/0.66	0.45/0.54
1/2 Inch Argon, Low-e(0.10), Fixed/Operable	0.60/0.72	0.50/0.60	0.40/0.48
Triple	0.75	0.55	0.50
1/2 Inch Air, Fixed/Operable	0.55/0.66	0.50/0.60	0.45/0.54
1/2 Inch Air, Low-e(0.20), Fixed/Operable	0.50/0.60	0.45/0.54	0.40/0.48
1/2 Inch Air, 2 Low-e(0.10), Fixed/Operable	0.45/0.54	0.35/0.42	0.30/0.36
1/2 Inch Argon, Low-e(0.10), Fixed/Operable	0.40/0.48	0.30/0.36	0.25/0.30

The category for aluminum frame with a thermal break is as defined in footnote 7 to Table 10-6A.

Overhead Glazing: Sloped Glazing (Including Frame)			
	U-Factor		
	Any Frame	Aluminum W/Thermal Break	Vinyl/Wood/ Fiberglass Frame
Single	1.74	1.74	1.74
Double	1.08	1.02	0.90
1/2 Inch Air, Fixed	0.90	0.84	0.72
1/2 Inch Air, Low-e(0.40), Fixed	0.84	0.72	0.60
1/2 Inch Air, Low-e(0.10), Fixed	0.78	0.66	0.54
1/2 Inch Argon, Low-e(0.10), Fixed	0.72	0.60	0.48
Triple	0.90	0.66	0.60
1/2 Inch Air, Fixed	0.66	0.60	0.54
1/2 Inch Air, Low-e (0.20), Fixed	0.60	0.54	0.48
1/2 Inch Air, 2 Low-e(0.10), Fixed	0.54	0.42	0.36
1/2 Inch Argon, 2 Low-e(0.10), Fixed	0.48	0.36	0.30

This default table is applicable to sloped glazing only. (Sloped glazing is a multiple-lite glazed system (similar to a curtain wall) that is mounted at a slope greater than 15° from the vertical plane.) Other overhead glazing shall use the defaults in Table 10-6E.

Opaque Doors	
	U-Factor
Uninsulated Metal	1.20
Insulated Metal (Including Fire Door and Smoke Vent)	0.60
Wood	0.50
Other Doors	See Table 10-6C

Notes:

Where a gap width is listed (i.e.: 1/2 inch), that is the minimum allowed.

Where a low-emissivity emittance is listed (i.e.: 0.40, 0.20, 0.10), that is the maximum allowed.

Where a gas other than air is listed (i.e.: Argon), the gas fill shall be a minimum of 90%.

Where an operator type is listed (i.e.: Fixed), the default is only allowed for that operator type. Where a frame type is listed (i.e.: Wood/vinyl), the default is only allowed for that frame type. Wood/vinyl frame includes reinforced vinyl and aluminum-clad wood.

TABLE 10-6A
Group R Occupancy: DEFAULT U-FACTORS FOR VERTICAL GLAZING

Description[1,2,3,4]			Frame Type[5,6]		
			Aluminum	Aluminum Thermal Break[7]	Wood/Vinyl
Windows	Single		1.20	1.20	1.20
	Double, < 1/2"	Clear	0.92	0.75	0.63
		Clear + Argon	0.87	0.71	0.60
		Low-e	0.85	0.69	0.58
		Low-e + Argon	0.79	0.62	0.53
	Double, ≥ 1/2"	Clear	0.86	0.69	0.58
		Clear + Argon	0.83	0.67	0.55
		Low-e	0.78	0.61	0.51
		Low-e + Argon	0.75	0.58	0.48
	Triple,	Clear	0.70	0.53	0.43
		Clear + Argon	0.69	0.52	0.41
		Low-e	0.67	0.49	0.40
		Low-e + Argon	0.63	0.47	0.37
Garden Windows	Single		2.60	n.a.	2.31
	Double	Clear	1.81	n.a.	1.61
		Clear + Argon	1.76	n.a.	1.56
		Low-e	1.73	n.a.	1.54
		Low-e + Argon	1.64	n.a.	1.47

1 < 1/2" = a minimum dead air space of less than 0.5 inches between the panes of glass.
≥ 1/2" = a minimum dead air space of 0.5 inches or greater between the panes of glass.
Where no gap width is listed, the minimum gap width is 1/4".

2 Any low-e (emissivity) coating (0.1, 0.2 or 0.4).

3 U-factors listed for argon shall consist of sealed, gas-filled insulated units for argon, C02, SF6, argon/SF6 mixtures and Krypton.

4 "Glass block" assemblies may use a U-factor of 0.51.

5 Insulated fiberglass framed products shall use wood/vinyl U-factors.

6 Aluminum clad wood windows shall use the U-factors listed for wood/vinyl windows.

7 Aluminum Thermal Break = An aluminum thermal break framed window shall incorporate the following minimum design characteristics:

a) The thermal conductivity of the thermal break material shall be not more than 3.6 Btu-in/h/ft^2/°F;

b) The thermal break material must produces a gap in the frame material of not less than 0.210 inches; and,

c) All metal framing members of the products exposed to interior and exterior air shall incorporate a thermal break meeting the criteria in a) and b) above.

TABLE 10-6B
All Occupancies: SMALL BUSINESS COMPLIANCE TABLE DEFAULT U-FACTORS FOR VERTICAL GLAZING

Vertical Glazing Description				Frame Type		
				Any Frame	Aluminum Thermal Break[2]	Wood/Vinyl Fiberglass
Panes	**Low-e[1]**	**Spacer**	**Fill**			
Double[3]	A	Any	Argon	0.48	0.41	0.32
	B	Any	Argon	0.46	0.39	0.30
	C	Any	Argon	0.44	0.37	0.28
	C	High Performance	Argon	0.42	0.35	Deemed to comply[5]
Triple[4]	A	Any	Air	0.50	0.44	0.26
	B	Any	Air	0.45	0.39	0.22
	C	Any	Air	0.41	0.34	0.20
	Any, double low-e	Any	Air	0.35	0.32	0.18

Footnotes to Table 10-6B

1. Low-eA (emissivity) shall be 0.24 to 0.16.
   Low-eB (emissivity) shall be 0.15 to 0.08.
   Low-eC (emissivity) shall be 0.07 or less.
2. Aluminum Thermal Break = An aluminum thermal break framed window shall incorporate the following minimum design characteristics:
   a) The thermal conductivity of the thermal break material shall be not more than 3.6 Btu-in/h/ft^2/° F;
   b) The thermal break material must produce a gap in the frame material of not less than 0.210 inches; and
   c) All metal framing members of the products exposed to interior and exterior air shall incorporate a thermal break meeting the criteria in a) and b) above.
3. A minimum air space of 0.375 inches between panes of glass is required for double glazing.
4. A minimum air space of 0.25 inches between panes of glass is required for triple glazing.
5. Deemed to comply glazing shall not be used for performance compliance.

TABLE 10-6C
Group R Occupancy: DEFAULT U-FACTORS FOR DOORS

Door Type	No Glazing	Single Glazing	Double Glazing with 1/4 in. Airspace	Double Glazing with 1/2 in. Airspace	Double Glazing with e = 0.10, 1/2 in. Argon
SWINGING DOORS (Rough opening - 38 in. x 82 in.)					
Slab Doors					
Wood slab in wood frame[a]	0.46				
6% glazing (22 in. x 8 in. lite)	-	0.48	0.47	0.46	0.44
25% glazing (22 in. x 36 in. lite)	-	0.58	0.48	0.46	0.42
45% glazing (22 in. x 64 in. lite)	-	0.69	0.49	0.46	0.39
More than 50% glazing		Use Table 10-6A			
Insulated steel slab with wood edge in wood frame[a]	0.16				
6% glazing (22 in. x 8 in. lite)	-	0.21	0.20	0.19	0.18
25% glazing (22 in. x 36 in. lite)	-	0.39	0.28	0.26	0.23
45% glazing (22 in. x 64 in. lite)	-	0.58	0.38	0.35	0.26
More than 50% glazing		Use Table 10-6A			
Foam insulated steel slab with metal edge in steel frame[b]	0.37				
6% glazing (22 in. x 8 in. lite)	-	0.44	0.42	0.41	0.39
25% glazing (22 in. x 36 in. lite)	-	0.55	0.50	0.48	0.44
45% glazing (22 in. x 64 in. lite)	-	0.71	0.59	0.56	0.48
More than 50% glazing		Use Table 10-6A			
Cardboard honeycomb slab with metal edge in steel frame[b]	0.61				
Style and Rail Doors					
Sliding glass doors/French doors		Use Table 10-6A			
Site-Assembled Style and Rail Doors					
Aluminum in aluminum frame	-	1.32	0.99	0.93	0.79
Aluminum in aluminum frame with thermal break	-	1.13	0.80	0.74	0.63

a. Thermally broken sill (add 0.03 for nonthermally broken sill)
b. Nonthermally broken sill
c. Nominal U-factors are through the center of the insulated panel before consideration of thermal bridges around the edges of the door sections and due to the frame.

REVOLVING DOORS	
Size (W x H)	**U-Factor**
3-wing	
8 ft. x 7 ft.	0.79
10 ft. x 8 ft.	0.80
4-wing	
7 ft. x 6.5 ft.	0.63
7 ft. x 7.5 ft.	0.64
Open	
82 in. x 84 in.	1.32

DOUBLE-SKIN STEEL EMERGENCY EXIT DOORS		
Core Insulation	**3 ft. x 6 ft. 8 in.**	**6 ft. x 6 ft. 8 in.**
1-3/8 in. thickness		
Honeycomb kraft paper	0.57	0.52
Mineral wool, steel ribs	0.44	0.36
Polyurethane foam	0.34	0.28
1-3/4 in. thickness		
Honeycomb kraft paper	0.57	0.54
Mineral wool, steel ribs	0.41	0.33
Polyurethane foam	0.31	0.26
1-3/8 in. thickness		
Honeycomb kraft paper	0.60	0.55
Mineral wool, steel ribs	0.47	0.39
Polyurethane foam	0.37	0.31
1-3/4 in. thickness		
Honeycomb kraft paper	0.60	0.57
Mineral wool, steel ribs	0.44	0.37
Polyurethane foam	0.34	0.30

DOUBLE-SKIN STEEL GARAGE AND AIRCRAFT HANGAR DOORS					
	One-piece tilt-up[a]		**Sectional tilt-up[b]**	**Aircraft hangar**	
Insulation[e]	**8 ft. x 7 ft.**	**16 ft. x 7 ft.**	**9 ft. x 7 ft.**	**72 ft. x 12 ft.[c]**	**240 ft. x 50 ft.[d]**
1-3/8 in. thickness					
EPS, steel ribs	0.36	0.33	0.34-0.39		
XPS, steel ribs	0.33	0.31	0.31-0.36		
2 in. thickness					
EPS, steel ribs	0.31	0.28	0.29-0.33		
XPS, steel ribs	0.29	0.26	0.27-0.31		
3 in. thickness					
EPS, steel ribs	0.26	0.23	0.25-0.28		
XPS, steel ribs	0.24	0.21	0.24-0.27		
4 in. thickness					
EPS, steel ribs	0.23	0.20	0.23-0.25		
XPS, steel ribs	0.21	0.19	0.21-0.24		
6 in. thickness					
EPS, steel ribs	0.20	0.16	0.20-0.21		
XPS, steel ribs	0.19	0.15	0.19-0.21		
4 in. thickness					
Non-insulated				1.10	1.23
Expanded polystyrene				0.25	0.16
Mineral wool, steel ribs				0.25	0.16
Extruded polystyrene				0.23	0.15
6 in. thickness					
Non-insulated				1.10	1.23
Expanded polystyrene				0.21	0.13
Mineral wool, steel ribs				0.23	0.13
Extruded polystyrene				0.20	0.12
Uninsulated					
All products	1.15				

a. Values are for thermally broken or thermally unbroken doors.
b. Lower values are for thermally broken doors; upper values are for doors with no thermal break.
c. Typical size for a small private airplane (single-engine or twin).
d. Typical hangar door for a midsize commercial jet airliner.
e. EPS is extruded polystyrene, XPS is expanded polystyrene.

TABLE 10-6D
Group R Occupancy: DEFAULT U-FACTORS FOR GLAZED DOORS
See Table 10-6C

TABLE 10-6E
Group R Occupancy: DEFAULT U-FACTORS FOR OVERHEAD GLAZING

Glazing Type	Frame Type: Aluminum without Thermal Break	Aluminum with Thermal Break	Reinforced Vinyl/ Aluminum-Clad Wood or Vinyl	Wood or Vinyl-Clad Wood/ Vinyl without Reinforcing
Single Glazing				
glass	U-1.58	U-1.51	U-1.40	U-1.18
acrylic/polycarb	U-1.52	U-1.45	U-1.34	U-1.11
Double Glazing				
air	U-1.05	U-0.89	U-0.84	U-0.67
argon	U-1.02	U-0.86	U-0.80	U-0.64
Double Glazing, *e* = 0.20				
air	U-0.96	U-0.80	U-0.75	U-0.59
argon	U-0.91	U-0.75	U-0.70	U-0.54
Double Glazing, *e* = 0.10				
air	U-0.94	U-0.79	U-0.74	U-0.58
argon	U-0.89	U-0.73	U-0.68	U-0.52
Double Glazing, *e* = 0.05				
air	U-0.93	U-0.78	U-0.73	U-0.56
argon	U-0.87	U-0.71	U-0.66	U-0.50
Triple Glazing				
air	U-0.90	U-0.70	U-0.67	U-0.51
argon	U-0.87	U-0.69	U-0.64	U-0.48
Triple Glazing, *e* = 0.20				
air	U-0.86	U-0.68	U-0.63	U-0.47
argon	U-0.82	U-0.63	U-0.59	U-0.43
Triple Glazing, *e* = 0.20 on 2 surfaces				
air	U-0.82	U-0.64	U-0.60	U-0.44
argon	U-0.79	U-0.60	U-0.56	U-0.40
Triple Glazing, *e* = 0.10 on 2 surfaces				
air	U-0.81	U-0.62	U-0.58	U-0.42
argon	U-0.77	U-0.58	U-0.54	U-0.38
Quadruple Glazing, *e* = 0.10 on 2x surfaces				
air	U-0.78	U-0.59	U-0.55	U-0.39
argon	U-0.74	U-0.56	U-0.52	U-0.36
krypton	U-0.70	U-0.52	U-0.48	U-0.32

1. U-factors are applicable to both glass and plastic, flat and domed units, all spacers and gaps.
2. Emissivities shall be less than or equal to the value specified.
3. Gap fill shall be assumed to be air unless there is a minimum of 90% argon or krypton.
4. Aluminum frame with thermal break is as defined in footnote 2 to Table 10-6B.

[Statutory Authority: RCW 19.27A.025, 19.27A.045. 10-03-115, 10-13-113 and 10-22-056, § 51-11-1006, filed 1/20/10, 6/21/10 and 10/28/10, effective 1/1/11. Statutory Authority: RCW 19.27A.022, 19.27A.025, 19.27A.045, and chapters 19.27 and 34.05 RCW. 07-01-089, § 51-11-1006, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27A.025, 19.27A.045 and chapters 19.27, 19.27A, and 34.05 RCW. 05-01-013, § 51-11-1006, filed 12/2/04, effective 7/1/05. Statutory Authority: RCW 19.27A.025, 19.27A.045. 02-01-112, § 51-11-1006, filed 12/18/01, effective 7/1/02; 01-03-010, § 51-11-1006, filed 1/5/01, effective 7/1/01; 98-03-003, § 51-11-1006, filed 1/8/98, effective 7/1/98. Statutory Authority: Chapters 19.27, 19.27A and 34.05 RCW. 94-05-059, § 51-11-1006, filed 2/10/94, effective 4/1/94. Statutory Authority: RCW 19.27A.020 and 1990 c 2. 91-01-112, § 51-11-1006, filed 12/19/90, effective 7/1/91.]

Reviser's note: Notice of Objection: The Joint Administrative Rules Review Committee (Committee) finds that, in adopting the 2009 proposed changes to the State Energy Code, Chapter 51-11 WAC, on November 20, 2009, the State Building Code Council (Council) failed to comply with all requirements of the law and failed to adequately respond to the Committee's request for additional economic impact and cost-benefit analyses prior to adoption.

On October 1, 2009, the Committee found that the Small Business Economic Impact Statement (SBEIS) for the proposed changes filed with the Code Reviser failed to comply with all requirements of law. The Committee requested that the Council conduct a cost-benefit analysis pursuant to RCW 34.05.328 and amend the SBEIS to provide additional economic impact information, including an estimate of the number of jobs that would be created or lost as a result of compliance with all the proposed rules, as required by RCW 19.85.040 (2)(d).

The Council provided the Committee with information and data on November 18, 2009. On December 2, 2009, the Committee found that the Council failed to adequately respond to the Committee's request for additional data. Specifically, the Committee found that the Council failed to amend the SBEIS to (a) estimate the number of jobs that would be created or lost as a result of compliance with the proposed changes; and (b) support the SBEIS with a detailed and rigorous costs analysis of the cumulative impact of all the changes. In addition, the Committee found that the Council failed to provide the Committee with a cost-benefit analysis of the proposed changes and pursuant to the requirements of RCW 34.05.328.

The Committee strongly supports a process that makes thoughtful and informed progress towards changes that result in improved energy efficiency in our buildings, wherever practicable. While the Council worked diligently, it is the opinion of the Committee that the Council did not fully develop and consider the economic impacts and costs versus benefits of these significant changes to our Energy Code. Furthermore, it is the opinion of the Committee

that the Council and the Legislature need this information to fully evaluate the value, impacts, and consequences of the proposed codes, with due diligence to their respective fiduciary responsibilities, in order to create the best informed public policy.

As a result, the Committee recommends that the Governor suspend the adoption and implementation of the changes to the Energy Code, Chapter 51-11 WAC, adopted by the Council on November 20, 2009, until such time as a more adequate analysis has been completed and considered by the appropriate bodies.

For all of the above stated reasons, the Committee objects to the changes to the State Energy Code, Chapter 51-11 WAC, that were adopted by the Council on November 20, 2009, and hereby directs the Code Reviser, pursuant to RCW 34.05.640(4), to publish this Notice of Objection in the Washington State Register and along with any publication in the Washington Administrative Code of changes to Chapter 51-11 WAC that were adopted by the Council in 2009 and filed with the Code Reviser.

WAC 51-11-1007 Section 1007 Ceilings.

1007.1 General: Table 10-7 lists heat-loss coefficients for the opaque portion of exterior ceilings below vented attics, vaulted ceilings, and roof decks in units of Btu/h•ft²•°F of ceiling.

They are derived from procedures listed in Standard RS-1, listed in Chapter 7. Ceiling U-factors are modified for the buffering effect of the attic, assuming an indoor temperature of 65° F and an outdoor temperature of 45°F.

Metal Framed Ceilings: The nominal R-values in Table 10-5A(2) - EFFECTIVE R-VALUES FOR METAL FRAMING AND CAVITY ONLY may be used for purposes of calculating metal framed ceiling section U-factors in lieu of the ASHRAE zone calculation method as provided in Chapter 27 of Standard RS-1.

Metal building roofs have a different construction and are addressed in Table 10-7(F).

1007.2 Component Description: The four types of ceilings are characterized as follows:

Ceilings Below a Vented Attic: Attic insulation is assumed to be blown-in, loose-fill fiberglass with a K-value of 2.6 hr•ft²•°F/Btu per inch. Full bag count for specified R-value is assumed in all cases. Ceiling dimensions for flat ceiling calculations are forty-five by thirty feet, with a gabled roof having a 4/12 pitch. The attic is assumed to vent naturally at the rate of three air changes per hour through soffit and ridge vents. A void fraction of 0.002 is assumed for all attics with insulation baffles. Standard-framed, unbaffled attics assume a void fraction of 0.008.

Attic framing is either standard or advanced. Standard framing assumes tapering of insulation depth around the perimeter with resultant decrease in thermal resistance. An increased R-value is assumed in the center of the ceiling due to the effect of piling leftover insulation. Advanced framing assumes full and even depth of insulation extending to the outside edge of exterior walls. Advanced framing does not change from the default value.

U-factors for flat ceilings below vented attics with standard framing may be modified with the following table:

	U-Factor for Standard Framing	
Roof Pitch	R-30	R-38
4/12	.036	.031
5/12	.035	.030
6/12	.034	.029
7/12	.034	.029
8/12	.034	.028
9/12	.034	.028
10/12	.033	.028
11/12	.033	.027
12/12	.033	.027

Vented scissors truss attics assume a ceiling pitch of 2/12 with a roof pitch of either 4/12 or 5/12. Unbaffled standard framed scissors truss attics are assumed to have a void fraction of 0.016.

Vaulted Ceilings: Insulation is assumed to be fiberglass batts installed in roof joist cavities. In the vented case, at least 1.5-inches between the top of the batts and the underside of the roof sheathing is left open for ventilation in each cavity. A ventilation rate of 3.0 air changes per hour is assumed. In the unvented or dense pack case, the ceiling cavity is assumed to be fully packed with insulation, leaving no space for ventilation.

EXCEPTION: Where spray polyurethane foam meets the requirements of Section 502.1.6.3 or 1313.2, the cavity shall be filled to the depth to achieve R-value requirements.

Roof Decks: Rigid insulation is applied to the top of roof decking with no space left for ventilation. Roofing materials are attached directly on top of the insulation. Framing members are often left exposed on the interior side.

Metal Truss Framing: Overall system tested values for the roof/ceiling U_o for metal framed truss assemblies from approved laboratories shall be used, when such data is acceptable to the building official.

Alternatively, the U_o for roof/ceiling assemblies using metal truss framing may be obtained from Tables 10-7A, 10-7B, 10-7C, 10-7D and 10-7E.

Steel Truss Framed Ceiling, Table 10-7A.

Steel Truss Framed Ceiling with R-3 Sheathing, Table 10-7B.

Steel Truss Framed Ceiling with R-5 Sheathing, Table 10-7C.

Steel Truss Framed Ceiling with R-10 Sheathing, Table 10-7D.

Steel Truss Framed Ceiling with R-15 Sheathing, Table 10-7E.

Metal Building Roof, Table 10-7F: The base assembly is a roof where the insulation is compressed when installed beneath metal roof panels attached to the steel structure (purlins). Additional assemblies include continuous insulation, uncompressed and uninterrupted by framing.

Single Layer. The rated R-value of insulation is for insulation installed perpendicular to and draped over purlins and then compressed when the metal roof panels are attached. A minimum R-3 (R-0.5) thermal spacer block between the purlins and the metal roof panels is required, unless compliance is shown by the overall assembly U-factor.

Double Layer. The first rated R-value of insulation is for insulation installed perpendicular to and draped over pur-

lins. The second rated R-value of insulation is for unfaced insulation installed above the first layer and parallel to the purlins and then compressed when the metal roof panels are attached. A minimum R-3 (R-0.5) thermal spacer block between the purlins and the metal roof panels is required, unless compliance is shown by the overall assembly U-factor.

Continuous Insulation. For continuous insulation (e.g., insulation boards or blankets), it is assumed that the insulation is installed below the purlins and is uninterrupted by framing members. Insulation exposed to the conditioned space or semiheated space shall have a facing, and all insulation seams shall be continuously sealed to provide a continuous air barrier.

Liner System (Ls). A continuous membrane is installed below the purlins and uninterrupted by framing members. Uncompressed, unfaced insulation rests on top of the membrane between the purlins. For multilayer installations, the last rated R-value of insulation is for unfaced insulation draped over purlins and then compressed when the metal roof panels are attached. A minimum R-3 (R-0.5) thermal spacer block between the purlins and the metal roof panels is required, unless compliance is shown by the overall assembly U-factor.

Filled Cavity. The first rated R-value of insulation is for faced insulation installed parallel to the purlins. The second rated R-value of insulation is for unfaced insulation installed above the first layer, parallel to and between the purlins and compressed when the metal roof panels are attached. The facer of the first layer of insulation is of sufficient width to be continuously sealed to the top flange of the purlins and to accommodate the full thickness of the second layer of insulation. A supporting structure retains the bottom of the first layer at the prescribed depth required for the full thickness of the second layer of insulation being installed above it. A minimum R-5 (R-0.9) thermal spacer block between the purlins and the metal roof panels is required, unless compliance is shown by the overall assembly U-factor.

U-factors for Metal Building Roofs. U-factors for metal building roofs shall be taken from Table 10-7F, provided the average purlin spacing is at least 52 in. and the R-value of the thermal spacer block is greater than or equal to the thermal spacer block R-value indicated in Table 10-7F for the assembly. It is not acceptable to use the U-factors in Table 10-7F if additional insulated sheathing is not continuous.

Roofs with Insulation Entirely Above Deck (uninterrupted by framing), Table 10-7G: The base assembly is continuous insulation over a structural deck. Added insulation is continuous and uninterrupted by framing. For the insulation, the first column lists the R-value for continuous insulation with a uniform thickness; the second column lists the comparable area-weighted average R-value for continuous insulation provided that the insulation thickness is never less than R-5 (except at roof drains) and that the slope is no greater than 1/4 inch per foot.

TABLE 10-7
DEFAULT U-FACTORS FOR CEILINGS

Ceilings Below Vented Attics

	Standard Frame	Advanced Frame
Flat Ceiling	**Baffled**	
R-19	0.049	0.047
R-30	0.036	0.032
R-38	0.031	0.026
R-49	0.027	0.020
R-60	0.025	0.017
Scissors Truss		
R-30 (4/12 roof pitch)	0.043	0.031
R-38 (4/12 roof pitch)	0.040	0.025
R-49 (4/12 roof pitch)	0.038	0.020
R-30 (5/12 roof pitch)	0.039	0.032
R-38 (5/12 roof pitch)	0.035	0.026
R-49 (5/12 roof pitch)	0.032	0.020
Vaulted Ceilings		
	16" O.C.	**24" O.C.**
Vented		
R-19 2x10 joist	0.049	0.048
R-30 2x12 joist	0.034	0.033
R-38 2x14 joist	0.027	0.027
Unvented		
R-30 2x10 joist	0.034	0.033
R-38 2x12 joist	0.029	0.027
R-21 + R-21 2x12 joist	0.026	0.025
Roof Deck		
	4x Beams, 48" O.C.	
R-12.5 2" Rigid insulation	0.064	
R-21.9 3.5" Rigid insulation	0.040	

			Standard Frame	Advanced Frame
R-37.5	6"	Rigid insulation	0.025	
R-50	8"	Rigid insulation	0.019	

Table 10-7A
Steel Truss[1] Framed Ceiling U_O

Cavity R-value	Truss Span (ft)												
	12	14	16	18	20	22	24	26	28	30	32	34	36
19	0.1075	0.0991	0.0928	0.0878	0.0839	0.0807	0.0780	0.0757	0.0737	0.0720	0.0706	0.0693	0.0681
30	0.0907	0.0823	0.0760	0.0710	0.0671	0.0638	0.0612	0.0589	0.0569	0.0552	0.0538	0.0525	0.0513
38	0.0844	0.0759	0.0696	0.0647	0.0607	0.0575	0.0548	0.0525	0.0506	0.0489	0.0474	0.0461	0.0449
49	0.0789	0.0704	0.0641	0.0592	0.0552	0.0520	0.0493	0.0470	0.0451	0.0434	0.0419	0.0406	0.0395

Table 10-7B
Steel Truss[1] Framed Ceiling U_O with R-3 Sheathing[2]

Cavity R-value	Truss Span (ft)												
	12	14	16	18	20	22	24	26	28	30	32	34	36
19	0.0809	0.0763	0.0728	0.0701	0.0679	0.0661	0.0647	0.0634	0.0623	0.0614	0.0606	0.0599	0.0592
30	0.0641	0.0595	0.0560	0.0533	0.0511	0.0493	0.0478	0.0466	0.0455	0.0446	0.0438	0.0431	0.0424
38	0.0577	0.0531	0.0496	0.0469	0.0447	0.0430	0.0415	0.0402	0.0392	0.0382	0.0374	0.0367	0.0361
49	0.0523	0.0476	0.0441	0.0414	0.0393	0.0375	0.0360	0.0348	0.0337	0.0328	0.0319	0.0312	0.0306

Table 10-7C
Steel Truss[1] Framed Ceiling U_O with R-5 Sheathing[2]

Cavity R-value	Truss Span (ft)												
	12	14	16	18	20	22	24	26	28	30	32	34	36
19	0.0732	0.0697	0.0670	0.0649	0.0633	0.0619	0.0608	0.0598	0.0590	0.0583	0.0577	0.0571	0.0567
30	0.0564	0.0529	0.0502	0.0481	0.0465	0.0451	0.0440	0.0430	0.0422	0.0415	0.0409	0.0403	0.0399
38	0.0501	0.0465	0.0438	0.0418	0.0401	0.0388	0.0376	0.0367	0.0359	0.0351	0.0345	0.0340	0.0335
49	0.0446	0.0410	0.0384	0.0363	0.0346	0.0333	0.0322	0.0312	0.0304	0.0297	0.0291	0.0285	0.0280

Table 10-7D
Steel Truss[1] Framed Ceiling U_O with R-10 Sheathing[2]

Cavity R-value	Truss Span (ft)												
	12	14	16	18	20	22	24	26	28	30	32	34	36
19	0.0626	0.0606	0.0590	0.0578	0.0569	0.0561	0.0555	0.0549	0.0545	0.0541	0.0537	0.0534	0.0531
30	0.0458	0.0437	0.0422	0.0410	0.0401	0.0393	0.0387	0.0381	0.0377	0.0373	0.0369	0.0366	0.0363
38	0.0394	0.0374	0.0359	0.0347	0.0337	0.0330	0.0323	0.0318	0.0313	0.0309	0.0305	0.0302	0.0299
49	0.0339	0.0319	0.0304	0.0292	0.0283	0.0275	0.0268	0.0263	0.0258	0.0254	0.0251	0.0247	0.0245

Table 10-7E
Steel Truss[1] Framed Ceiling U_O with R-15 Sheathing[2]

Cavity R-value	Truss Span (ft)												
	12	14	16	18	20	22	24	26	28	30	32	34	36
19	0.0561	0.0550	0.0541	0.0535	0.0530	0.0526	0.0522	0.0519	0.0517	0.0515	0.0513	0.0511	0.0509
30	0.0393	0.0382	0.0373	0.0367	0.0362	0.0358	0.0354	0.0351	0.0349	0.0347	0.0345	0.0343	0.0341
38	0.0329	0.0318	0.0310	0.0303	0.0298	0.0294	0.0291	0.0288	0.0285	0.0283	0.0281	0.0279	0.0278
49	0.0274	0.0263	0.0255	0.0249	0.0244	0.0239	0.0236	0.0233	0.0230	0.0228	0.0226	0.0225	0.0223

1 - Assembly values based on 24 inch on center truss spacing; 11 Truss member connections penetrating insulation (4 at the eaves, 7 in the interior space); 1/2 inch drywall ceiling; all truss members are 2x4 "C" channels with a solid web.

2 - Ceiling sheathing installed between bottom chord and drywall.

TABLE 10-7F
Default U-Factors for Metal Building Roofs

Insulation System	Rated R-Value of Insulation	Overall U-Factor for Entire Base Roof Assembly	Overall U-Factor for Assembly of Base Roof Plus Continuous Insulation (uninterrupted by framing) Rated R-Value of Continuous Insulation					
			R-6.5	R-13	R-19.5	R-26	R-32.5	R-39
Standing Seam Roofs with Thermal Spacer Blocks[a,b]								
Single Layer	None	1.280	0.137	0.073	0.049	0.037	0.030	0.025
	R-10	0.115	0.066	0.046	0.035	0.029	0.024	0.021
	R-11	0.107	0.063	0.045	0.035	0.028	0.024	0.021
	R-13	0.101	0.061	0.044	0.034	0.028	0.024	0.020
	R-16	0.096	0.059	0.043	0.033	0.027	0.023	0.020
	R-19	0.082	0.053	0.040	0.031	0.026	0.022	0.020
	R-10 + R-10	0.088	0.056	0.041	0.032	0.027	0.023	0.020
	R-10 + R-11	0.086	0.055	0.041	0.032	0.027	0.023	0.020
	R-11 + R-11	0.085	0.055	0.040	0.032	0.026	0.023	0.020
	R-10 + R-13	0.084	0.054	0.040	0.032	0.026	0.023	0.020

Insulation System	Rated R-Value of Insulation	Overall U-Factor for Entire Base Roof Assembly	Overall U-Factor for Assembly of Base Roof Plus Continuous Insulation (uninterrupted by framing) Rated R-Value of Continuous Insulation					
			R-6.5	R-13	R-19.5	R-26	R-32.5	R-39
Double Layer	R-11 + R-13	0.082	0.053	0.040	0.032	0.026	0.022	0.020
	R-13 + R-13	0.075	0.050	0.038	0.030	0.025	0.022	0.019
	R-10 + R-19	0.074	0.050	0.038	0.030	0.025	0.022	0.019
	R-11 + R-19	0.072	0.049	0.037	0.030	0.025	0.022	0.019
	R-13 + R-19	0.068	0.047	0.036	0.029	0.025	0.021	0.019
	R-16 + R-19	0.065	0.046	0.035	0.029	0.024	0.021	0.018
	R-19 + R-19	0.060	0.043	0.034	0.028	0.023	0.020	0.018
Liner System	R-19 + R-11	0.035						
	R-25 + R-11	0.031						
	R-30 + R-11	0.029						
	R-25 + R-11 + R-11	0.026						
Filled Cavity with Thermal Spacer Blocks[c]								
	R-10 + R-19	0.057	0.042	0.033	0.027	0.023	0.020	0.018
Standing Seam Roofs without Thermal Spacer Blocks								
Liner System	R-19 + R-11	0.040						
Thru-Fastened Roofs without Thermal Spacer Blocks								
Single Layer	R-10	0.184						
	R-11	0.182						
	R-13	0.174						
	R-16	0.157						
	R-19	0.151						
Liner System	R-19 + R-11	0.044						
(Multiple R-values are listed in order from inside to outside)								

a. A standing seam roof clip that provides a minimum 1.5 in. distance between the top of the purlins and the underside of the metal roof panels is required.
b. A minimum R-3 thermal spacer block is required.
c. A minimum R-5 thermal spacer block is required.

TABLE 10-7G
Assembly U-Factors for Roofs with Insulation Entirely Above Deck (uninterrupted by framing)

Rated R-Value of Insulation Alone: Minimum Throughout, Unsloped	Rated R-Value of Insulation Alone: Average (R-5 minimum), Sloped (1/4 inch per foot maximum)	Overall U-Factor for Entire Assembly
R-0	Not Allowed	U-1.282
R-1	Not Allowed	U-0.562
R-2	Not Allowed	U-0.360
R-3	Not Allowed	U-0.265
R-4	Not Allowed	U-0.209
R-5	Not Allowed	U-0.173
R-6	R-7	U-0.147
R-7	R-8	U-0.129
R-8	R-9	U-0.114
R-9	R-10	U-0.102
R-10	R-12	U-0.093
R-11	R-13	U-0.085
R-12	R-15	U-0.078
R-13	R-16	U-0.073
R-14	R-18	U-0.068
R-15	R-20	U-0.063
R-16	R-22	U-0.060
R-17	R-23	U-0.056
R-18	R-25	U-0.053
R-19	R-27	U-0.051
R-20	R-29	U-0.048
R-21	R-31	U-0.046
R-22	R-33	U-0.044
R-23	R-35	U-0.042
R-24	R-37	U-0.040
R-25	R-39	U-0.039
R-26	R-41	U-0.037
R-27	R-43	U-0.036
R-28	R-46	U-0.035
R-29	R-48	U-0.034
R-30	R-50	U-0.032
R-35	R-61	U-0.028
R-40	R-73	U-0.025
R-45	R-86	U-0.022
R-50	R-99	U-0.020
R-55	R-112	U-0.018
R-60	R-126	U-0.016

[Statutory Authority: RCW 19.27A.025, 19.27A.045. 10-22-057, § 51-11-1007, filed 10/28/10, effective 1/1/11; 10-03-115, 10-13-113 and 10-22-056, § 51-11-1007, filed 1/20/10, 6/21/10 and 10/28/10, effective 1/1/11. Statutory Authority: RCW 19.27A.020, 19.27A.045. 04-01-106, § 51-11-1007, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27A.025, 19.27A.045. 01-03-010, § 51-11-1007, filed 1/5/01, effective 7/1/01; 98-03-003, § 51-11-1007, filed 1/8/98, effective 7/1/98. Statutory Authority: RCW 19.27A.020 and 1990 c 2. 91-01-112, § 51-11-1007, filed 12/19/90, effective 7/1/91.]

Reviser's note: Notice of Objection: The Joint Administrative Rules Review Committee (Committee) finds that, in adopting the 2009 proposed changes to the State Energy Code, Chapter 51-11 WAC, on November 20, 2009, the State Building Code Council (Council) failed to comply with all requirements of the law and failed to adequately respond to the Committee's

request for additional economic impact and cost-benefit analyses prior to adoption.

On October 1, 2009, the Committee found that the Small Business Economic Impact Statement (SBEIS) for the proposed changes filed with the Code Reviser failed to comply with all requirements of law. The Committee requested that the Council conduct a cost-benefit analysis pursuant to RCW 34.05.328 and amend the SBEIS to provide additional economic impact information, including an estimate of the number of jobs that would be created or lost as a result of compliance with all the proposed rules, as required by RCW 19.85.040 (2)(d).

The Council provided the Committee with information and data on November 18, 2009. On December 2, 2009, the Committee found that the Council failed to adequately respond to the Committee's request for additional data. Specifically, the Committee found that the Council failed to amend the SBEIS to (a) estimate the number of jobs that would be created or lost as a result of compliance with the proposed changes; and (b) support the SBEIS with a detailed and rigorous costs analysis of the cumulative impact of all the changes. In addition, the Committee found that the Council failed to provide the Committee with a cost-benefit analysis of the proposed changes and pursuant to the requirements of RCW 34.05.328.

The Committee strongly supports a process that makes thoughtful and informed progress towards changes that result in improved energy efficiency in our buildings, wherever practicable. While the Council worked diligently, it is the opinion of the Committee that the Council did not fully develop and consider the economic impacts and costs versus benefits of these significant changes to our Energy Code. Furthermore, it is the opinion of the Committee that the Council and the Legislature need this information to fully evaluate the value, impacts, and consequences of the proposed codes, with due diligence to their respective fiduciary responsibilities, in order to create the best informed public policy.

As a result, the Committee recommends that the Governor suspend the adoption and implementation of the changes to the Energy Code, Chapter 51-11 WAC, adopted by the Council on November 20, 2009, until such time as a more adequate analysis has been completed and considered by the appropriate bodies.

For all of the above stated reasons, the Committee objects to the changes to the State Energy Code, Chapter 51-11 WAC, that were adopted by the Council on November 20, 2009, and hereby directs the Code Reviser, pursuant to RCW 34.05.640(4), to publish this Notice of Objection in the Washington State Register and along with any publication in the Washington Administrative Code of changes to Chapter 51-11 WAC that were adopted by the Council in 2009 and filed with the Code Reviser.

WAC 51-11-1008 Section 1008 Air infiltration.

1008.1 General: Tables 10-8 and 10-8A list effective air change rates and heat capacities for heat loss due to infiltration for single-family residential.

Estimated seasonal average infiltration rate in air changes per hour (ACH) is given for standard air-leakage control (see section 502.4 of this code for air leakage requirements for single-family residential). The effective air-change rate shall be used in calculations for compliance under either the Component Performance or Systems Analysis approaches.

Heat loss due to infiltration shall be computed using the following equation:

$$Q_{infil} = ACH_{eff} * HCP$$

where: Q_{infil} = Heat loss due to air infiltration

ACH_{eff} = the effective air infiltration rate in Table 10-8

HCP = the Heat Capacity Density Product for the appropriate elevation or climate zone as given below.

TABLE 10-8
ASSUMED EFFECTIVE AIR CHANGES PER HOUR

Air-Leakage Control Package	Air Changes per Hour Natural	Effective
Standard	0.35	0.35

TABLE 10-8A
DEFAULT HEAT CAPACITY/DENSITY PRODUCT FOR AIR

Zone	Average Elevation	Heat Capacity/Density
1	Mean Sea Level	0.0180 Btu/h•°F
2	2000	0.0168 Btu/h•°F
3	3000	0.0162 Btu/h•°F

[Statutory Authority: RCW 19.27A.025, 19.27A.045. 10-03-115, 10-13-113 and 10-22-056, § 51-11-1008, filed 1/20/10, 6/21/10 and 10/28/10, effective 1/1/11; 01-03-010, § 51-11-1008, filed 1/5/01, effective 7/1/01; 98-03-003, § 51-11-1008, filed 1/8/98, effective 7/1/98. Statutory Authority: RCW 19.27A.020 and 1990 c 2. 91-01-112, § 51-11-1008, filed 12/19/90, effective 7/1/91.]

Reviser's note: Notice of Objection: The Joint Administrative Rules Review Committee (Committee) finds that, in adopting the 2009 proposed changes to the State Energy Code, Chapter 51-11 WAC, on November 20, 2009, the State Building Code Council (Council) failed to comply with all requirements of the law and failed to adequately respond to the Committee's request for additional economic impact and cost-benefit analyses prior to adoption.

On October 1, 2009, the Committee found that the Small Business Economic Impact Statement (SBEIS) for the proposed changes filed with the Code Reviser failed to comply with all requirements of law. The Committee requested that the Council conduct a cost-benefit analysis pursuant to RCW 34.05.328 and amend the SBEIS to provide additional economic impact information, including an estimate of the number of jobs that would be created or lost as a result of compliance with all the proposed rules, as required by RCW 19.85.040 (2)(d).

The Council provided the Committee with information and data on November 18, 2009. On December 2, 2009, the Committee found that the Council failed to adequately respond to the Committee's request for additional data. Specifically, the Committee found that the Council failed to amend the SBEIS to (a) estimate the number of jobs that would be created or lost as a result of compliance with the proposed changes; and (b) support the SBEIS with a detailed and rigorous costs analysis of the cumulative impact of all the changes. In addition, the Committee found that the Council failed to provide the Committee with a cost-benefit analysis of the proposed changes and pursuant to the requirements of RCW 34.05.328.

The Committee strongly supports a process that makes thoughtful and informed progress towards changes that result in improved energy efficiency in our buildings, wherever practicable. While the Council worked diligently, it is the opinion of the Committee that the Council did not fully develop and consider the economic impacts and costs versus benefits of these significant changes to our Energy Code. Furthermore, it is the opinion of the Committee that the Council and the Legislature need this information to fully evaluate the value, impacts, and consequences of the proposed codes, with due diligence to their respective fiduciary responsibilities, in order to create the best informed public policy.

As a result, the Committee recommends that the Governor suspend the adoption and implementation of the changes to the Energy Code, Chapter 51-11 WAC, adopted by the Council on November 20, 2009, until such time as a more adequate analysis has been completed and considered by the appropriate bodies.

For all of the above stated reasons, the Committee objects to the changes to the State Energy Code, Chapter 51-11 WAC, that were adopted by the Council on November 20, 2009, and hereby directs the Code Reviser, pursuant to RCW 34.05.640(4), to publish this Notice of Objection in the Washington State Register and along with any publication in the Washington Administrative Code of changes to Chapter 51-11 WAC that were adopted by the Council in 2009 and filed with the Code Reviser.

WAC 51-11-1009 Section 1009 Mass.

1009.1 General: Tables 10-9 and 10-10 list default mass values for concrete masonry construction. Calculations are

based on standard ASHRAE values for heat-storage capacity as listed in Standard RS-1, Chapter 26.

Thermal capacity of furniture is ignored, as is heat storage beyond the first four inches of mass thickness. All mass is assumed to be in direct contact with the conditioned space. Concrete separated from the heated volume by other materials must multiply the listed concrete mass value by the result of the following formula:

Ln(R-value) x (-.221) + 0.5
Where:
Ln = Natural log
R-value = R-value of material covering concrete

Note: All default values for covered concrete slabs have been adjusted according to this procedure.

1009.2 Mass Description: Mass is divided into two types: Structural and additional.

Structural Mass: Includes heat-storage capacity of all standard building components of a typical residential structure, including floors, ceilings, and interior and exterior walls in Btu/ft²•°F of floor area. It also assumes exterior wall, interior wall and ceiling surface area approximately equals three times the floor area.

Additional Mass: Includes any additional building material not part of the normal structure, which is added specifically to increase the building's thermal-storage capability. This category includes masonry fireplaces, water or trombe walls, and extra layers of sheetrock. Coefficients are in Btu/ft²•°F of surface area of material exposed to conditioned space. The coefficient for water is Btu/°F•gallon.

1009.3 Component Description: Light frame assumes one inch thick wood flooring with five-eighths inch sheetrock on ceilings and interior walls, and walls consisting of either five-eighths inch sheetrock or solid logs. Slab assumes a four-inch concrete slab on or below grade, with five-eighths inch sheetrock on exterior and interior walls and ceiling, and with separate values for interior or exterior wall insulation. Adjustments for slab covering is based on R-value of material. Additional mass values are based on the density multiplied by the specific heat of the material adjusted for listed thickness.

TABLE 10-9
HEAT CAPACITY

	Partial Grout	Solid Grout
8" CMU	9.65	15.0
12" CMU	14.5	23.6
8" Brick	10.9	16.4
6" Concrete	NA	14.4

TABLE 10-10
DEFAULT MASS VALUES

Structural Mass M-value	**Btu/ft²•°F floor area**
Light Frame:	
Joisted/post & beam floor, sheetrock walls and ceilings	3.0
Joisted/post & beam floor, log walls, sheetrock ceilings	4.0
Slab With Interior Wall Insulation:	
Slab, no covering or tile, sheetrock walls and ceilings	10.0
Slab, hardwood floor covering, sheetrock walls and ceilings	7.0
Slab, carpet and pad, sheetrock walls and ceilings	5.0
Slab With Exterior Wall Insulation:	
Slab, no covering or tile, sheetrock walls and ceilings	12.0
Slab, hardwood floor covering, sheetrock walls and ceilings	9.0
Slab, carpet and pad, sheetrock walls and ceilings	7.0
Additional Mass M-Value:	**Btu/ft²•°F surface area**
Gypsum wallboard, 1/2 inch thickness	0.54
Gypsum wallboard, 5/8 inch thickness	0.68
Hardwood floor	1.40
Concrete/Brick, 4 inch-thickness	10.30
Concrete/Brick, 6 inch-thickness	15.40
	Btu/°F•gallon
Water, 1 gallon	8.0

[Statutory Authority: RCW 19.27A.025, 19.27A.045. 10-03-115, 10-13-113 and 10-22-056, § 51-11-1009, filed 1/20/10, 6/21/10 and 10/28/10, effective 1/1/11. Statutory Authority: RCW 19.27A.020, 19.27A.045. 04-01-106, § 51-11-1009, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27A.025, 19.27A.045. 01-03-010, § 51-11-1009, filed 1/5/01, effective 7/1/01; 98-03-003, § 51-11-1009, filed 1/8/98, effective 7/1/98. Statutory Authority: RCW 19.27A.020 and 1990 c 2. 91-01-112, § 51-11-1009, filed 12/19/90, effective 7/1/91.]

Reviser's note: Notice of Objection: The Joint Administrative Rules Review Committee (Committee) finds that, in adopting the 2009 proposed changes to the State Energy Code, Chapter 51-11 WAC, on November 20, 2009, the State Building Code Council (Council) failed to comply with all requirements of the law and failed to adequately respond to the Committee's request for additional economic impact and cost-benefit analyses prior to adoption.

On October 1, 2009, the Committee found that the Small Business Economic Impact Statement (SBEIS) for the proposed changes filed with the Code Reviser failed to comply with all requirements of law. The Committee requested that the Council conduct a cost-benefit analysis pursuant to RCW 34.05.328 and amend the SBEIS to provide additional economic impact information, including an estimate of the number of jobs that would be created or lost as a result of compliance with all the proposed rules, as required by RCW 19.85.040 (2)(d).

The Council provided the Committee with information and data on November 18, 2009. On December 2, 2009, the Committee found that the Council failed to adequately respond to the Committee's request for additional data. Specifically, the Committee found that the Council failed to amend the SBEIS to (a) estimate the number of jobs that would be created or lost as a result of compliance with the proposed changes; and (b) support the SBEIS with a detailed and rigorous costs analysis of the cumulative impact of all the changes. In addition, the Committee found that the Council failed to provide the Committee with a cost-benefit analysis of the proposed changes and pursuant to the requirements of RCW 34.05.328.

The Committee strongly supports a process that makes thoughtful and informed progress towards changes that result in improved energy efficiency in our buildings, wherever practicable. While the Council worked diligently, it is the opinion of the Committee that the Council did not fully develop and consider the economic impacts and costs versus benefits of these significant changes to our Energy Code. Furthermore, it is the opinion of the Committee that the Council and the Legislature need this information to fully evaluate the value, impacts, and consequences of the proposed codes, with due diligence to their respective fiduciary responsibilities, in order to create the best informed public policy.

As a result, the Committee recommends that the Governor suspend the adoption and implementation of the changes to the Energy Code, Chapter 51-11 WAC, adopted by the Council on November 20, 2009, until such time as a more adequate analysis has been completed and considered by the appropriate bodies.

For all of the above stated reasons, the Committee objects to the changes to the State Energy Code, Chapter 51-11 WAC, that were adopted by the Council on November 20, 2009, and hereby directs the Code Reviser, pursuant to RCW 34.05.640(4), to publish this Notice of Objection in the Washington State Register and along with any publication in the Washington Administrative Code of changes to Chapter 51-11 WAC that were adopted by the Council in 2009 and filed with the Code Reviser.

WAC 51-11-1120 Scope. This Code sets forth minimum requirements for the design and commissioning of new or altered buildings and structures or portions thereof that provide facilities or shelter for public assembly, educational, business, mercantile, institutional, storage, factory, industrial, and multifamily residential occupancies by regulating their exterior envelopes and the selection of their mechanical systems, domestic water systems, electrical distribution and illuminating systems and equipment for efficient use and conservation of energy.

EXCEPTION: The provisions of this code do not apply to temporary growing structures used solely for the commercial production of horticultural plants including ornamental plants, flowers, vegetables, and fruits. "Temporary growing structure" means a structure that has the sides and roof covered with polyethylene, polyvinyl, or similar flexible synthetic material and is used to provide plants with either frost protection or increased heat retention. A temporary growing structure is not considered a building for purposes of this code.

[Statutory Authority: RCW 19.27A.025, 19.27A.045. 10-03-115, 10-13-113 and 10-22-056, § 51-11-1120, filed 1/20/10, 6/21/10 and 10/28/10, effective 1/1/11; 98-03-003, § 51-11-1120, filed 1/8/98, effective 7/1/98. Statutory Authority: RCW 19.27A.025. 93-21-052, § 51-11-1120, filed 10/18/93, effective 4/1/94.]

Reviser's note: Notice of Objection: The Joint Administrative Rules Review Committee (Committee) finds that, in adopting the 2009 proposed changes to the State Energy Code, Chapter 51-11 WAC, on November 20, 2009, the State Building Code Council (Council) failed to comply with all requirements of the law and failed to adequately respond to the Committee's request for additional economic impact and cost-benefit analyses prior to adoption.

On October 1, 2009, the Committee found that the Small Business Economic Impact Statement (SBEIS) for the proposed changes filed with the Code Reviser failed to comply with all requirements of law. The Committee requested that the Council conduct a cost-benefit analysis pursuant to RCW 34.05.328 and amend the SBEIS to provide additional economic impact information, including an estimate of the number of jobs that would be created or lost as a result of compliance with all the proposed rules, as required by RCW 19.85.040 (2)(d).

The Council provided the Committee with information and data on November 18, 2009. On December 2, 2009, the Committee found that the Council failed to adequately respond to the Committee's request for additional data. Specifically, the Committee found that the Council failed to amend the SBEIS to (a) estimate the number of jobs that would be created or lost as a result of compliance with the proposed changes; and (b) support the SBEIS with a detailed and rigorous costs analysis of the cumulative impact of all the changes. In addition, the Committee found that the Council failed to provide the Committee with a cost-benefit analysis of the proposed changes and pursuant to the requirements of RCW 34.05.328.

The Committee strongly supports a process that makes thoughtful and informed progress towards changes that result in improved energy efficiency in our buildings, wherever practicable. While the Council worked diligently, it is the opinion of the Committee that the Council did not fully develop and consider the economic impacts and costs versus benefits of these significant changes to our Energy Code. Furthermore, it is the opinion of the Committee that the Council and the Legislature need this information to fully evaluate the value, impacts, and consequences of the proposed codes, with due diligence to their respective fiduciary responsibilities, in order to create the best informed public policy.

As a result, the Committee recommends that the Governor suspend the adoption and implementation of the changes to the Energy Code, Chapter 51-11 WAC, adopted by the Council on November 20, 2009, until such time as a more adequate analysis has been completed and considered by the appropriate bodies.

For all of the above stated reasons, the Committee objects to the changes to the State Energy Code, Chapter 51-11 WAC, that were adopted by the Council on November 20, 2009, and hereby directs the Code Reviser, pursuant to RCW 34.05.640(4), to publish this Notice of Objection in the Washington State Register and along with any publication in the Washington Administrative Code of changes to Chapter 51-11 WAC that were adopted by the Council in 2009 and filed with the Code Reviser.

WAC 51-11-1131 Additions to existing buildings. Additions to existing buildings or structures may be constructed without making the entire building or structure comply, provided that the new additions shall conform to the provisions of this Code.

EXCEPTION: New additions which do not fully comply with the requirements of this Code and which have a floor area which is less than seven hundred fifty square feet may be approved provided that improvements are made to the existing building to compensate for any deficiencies in the new addition. Compliance shall be demonstrated by either systems analysis per Section 1141.4 or component performance calculations per Sections 1330 through 1334. The nonconforming addition and upgraded, existing building shall have an energy budget or target UA and SHGC that are less than or equal to the unimproved existing building, with the addition designed to comply with this Code. These additions are also exempt from Section 1314.6.

[Statutory Authority: RCW 19.27A.025, 19.27A.045. 10-03-115, 10-13-113 and 10-22-056, § 51-11-1131, filed 1/20/10, 6/21/10 and 10/28/10, effective 1/1/11. Statutory Authority: RCW 19.27A.025. 93-21-052, § 51-11-1131, filed 10/18/93, effective 4/1/94.]

Reviser's note: Notice of Objection: The Joint Administrative Rules Review Committee (Committee) finds that, in adopting the 2009 proposed changes to the State Energy Code, Chapter 51-11 WAC, on November 20,

2009, the State Building Code Council (Council) failed to comply with all requirements of the law and failed to adequately respond to the Committee's request for additional economic impact and cost-benefit analyses prior to adoption.

On October 1, 2009, the Committee found that the Small Business Economic Impact Statement (SBEIS) for the proposed changes filed with the Code Reviser failed to comply with all requirements of law. The Committee requested that the Council conduct a cost-benefit analysis pursuant to RCW 34.05.328 and amend the SBEIS to provide additional economic impact information, including an estimate of the number of jobs that would be created or lost as a result of compliance with all the proposed rules, as required by RCW 19.85.040 (2)(d).

The Council provided the Committee with information and data on November 18, 2009. On December 2, 2009, the Committee found that the Council failed to adequately respond to the Committee's request for additional data. Specifically, the Committee found that the Council failed to amend the SBEIS to (a) estimate the number of jobs that would be created or lost as a result of compliance with the proposed changes; and (b) support the SBEIS with a detailed and rigorous costs analysis of the cumulative impact of all the changes. In addition, the Committee found that the Council failed to provide the Committee with a cost-benefit analysis of the proposed changes and pursuant to the requirements of RCW 34.05.328.

The Committee strongly supports a process that makes thoughtful and informed progress towards changes that result in improved energy efficiency in our buildings, wherever practicable. While the Council worked diligently, it is the opinion of the Committee that the Council did not fully develop and consider the economic impacts and costs versus benefits of these significant changes to our Energy Code. Furthermore, it is the opinion of the Committee that the Council and the Legislature need this information to fully evaluate the value, impacts, and consequences of the proposed codes, with due diligence to their respective fiduciary responsibilities, in order to create the best informed public policy.

As a result, the Committee recommends that the Governor suspend the adoption and implementation of the changes to the Energy Code, Chapter 51-11 WAC, adopted by the Council on November 20, 2009, until such time as a more adequate analysis has been completed and considered by the appropriate bodies.

For all of the above stated reasons, the Committee objects to the changes to the State Energy Code, Chapter 51-11 WAC, that were adopted by the Council on November 20, 2009, and hereby directs the Code Reviser, pursuant to RCW 34.05.640(4), to publish this Notice of Objection in the Washington State Register and along with any publication in the Washington Administrative Code of changes to Chapter 51-11 WAC that were adopted by the Council in 2009 and filed with the Code Reviser.

WAC 51-11-1132 Alterations and repairs. Alterations and repairs to buildings or portions thereof originally constructed subject to the requirements of this Code shall conform to the provisions of this Code without the use of the exception in Section 1130. Other alterations and repairs may be made to existing buildings and moved buildings without making the entire building comply with all of the requirements of this Code for new buildings, provided the following requirements are met:

1132.1 Building Envelope: Alterations or repairs shall comply with nominal R-values and glazing requirements in Table 13-1 or 13-2.

EXCEPTIONS:

1. Storm windows installed over existing glazing.
2. Glass replaced in existing sash and frame provided that glazing is of equal or lower U-factor.
3. For solar heat gain coefficient compliance, glazing with a solar heat gain coefficient equal to or lower than that of the other existing glazing.
4. Existing roof/ceiling, wall or floor cavities exposed during construction provided that these cavities are insulated to full depth with insulation having a minimum nominal value of R-3.0 per inch installed per Sections 1311 and 1313.
5. Existing walls and floors without framing cavities, provided that any new cavities added to existing walls and floors comply with Exception 4.
6. Existing roofs where the roof membrane is being replaced and
   a. The roof sheathing or roof insulation is not exposed; or
   b. If there is existing roof insulation below the deck.

In no case shall the energy efficiency of the building be decreased.

1132.2 Mechanical Systems: Those parts of systems which are altered or replaced shall comply with Chapter 14 of this Code. Additions or alterations shall not be made to an existing mechanical system that will cause the existing mechanical system to become out of compliance.

All new systems in existing buildings, including packaged unitary equipment and packaged split systems, shall comply with Chapter 14.

Where mechanical cooling is added to a space that was not previously cooled, the mechanical cooling system shall comply with Sections 1413 and either 1423 or 1433.

EXCEPTIONS: These exceptions only apply to situations where mechanical cooling is added to a space that was not previously cooled.

1. Water-cooled refrigeration equipment provided with a water economizer meeting the requirements of Section 1413 need not comply with 1423 or 1433. This exception shall not be used for RS-29 analysis.
2. Alternate designs that are not in full compliance with this Code may be approved when the building official determines that existing building or occupancy constraints make full compliance impractical or where full compliance would be economically impractical.

Alterations to existing mechanical cooling systems shall not decrease economizer capacity unless the system complies with Sections 1413 and either 1423 or 1433. In addition, for existing mechanical cooling systems that do not comply with Sections 1413 and either 1423 or 1433, including both the individual unit size limits and the total building capacity limits on units without economizer, other alterations shall comply with Table 11-1.

When space cooling equipment is replaced, controls shall be installed to provide for integrated operation with economizer in accordance with Section 1413.3.

Existing equipment currently in use may be relocated within the same floor or same tenant space if removed and reinstalled within the same permit.

TABLE 11-1: ECONOMIZER COMPLIANCE OPTIONS FOR MECHANICAL ALTERATIONS

	Option A	Option B (alternate to A)	Option C (alternate to A)	Option D (alternate to A)
Unit Type	**Any alteration with new or replacement equipment**	**Replacement unit of the same type with the same or smaller output capacity**	**Replacement unit of the same type with a larger output capacity**	**New equipment added to existing system or replacement unit of a different type**
1. Packaged Units	Efficiency: min.[1] Economizer: 1433[2]	Efficiency: min.[1] Economizer: 1433[2,3]	Efficiency: min.[1] Economizer: 1433[2,3]	Efficiency: min.[1] Economizer: 1433[2,4]
2. Split Systems	Efficiency: min.[1] Economizer: 1433[2]	Efficiency: + 10/5%[5] Economizer: shall not decrease existing economizer capability	Only for new units < 54,000 Btu/h replacing unit installed prior to 1991 (one of two): Efficiency: + 10/5%[5] Economizer: 50%[6] For units > 54,000 Btu/h or any units installed after 1991: Option A	Efficiency: min.[1] Economizer: 1433[2,4]
3. Water Source Heat Pump	Efficiency: min.[1] Economizer: 1433[2]	(two of three): Efficiency: + 10/5%[5] Flow control valve[7] Economizer: 50%[6]	(three of three): Efficiency: + 10/5%[5] Flow control valve[7] Economizer: 50%[6] (except for certain pre-1991 systems[8])	Efficiency: min.[1] Economizer: 1433[2,4] (except for certain pre-1991 systems[8])
4. Hydronic Economizer using Air-Cooled Heat Rejection Equipment (Dry Cooler)	Efficiency: min.[1] Economizer: 1433[2]	Efficiency: + 10/5%[5] Economizer: shall not decrease existing economizer capacity	Option A	Efficiency: min.[1] Economizer: 1433[2,4]
5. Air-Handling Unit (including fan coil units) where the system has an air-cooled chiller	Efficiency: min.[1] Economizer: 1433[2]	Economizer: shall not decrease existing economizer capacity	Option A (except for certain pre-1991 systems[8])	Option A (except for certain pre-1991 systems[8])
6. Air-Handling Unit (including fan coil units) and Water-cooled Process Equipment, where the system has a water-cooled chiller[10]	Efficiency: min.[1] Economizer: 1433[2]	Economizer: shall not decrease existing economizer capacity	Option A (except for certain pre-1991 systems[8] and certain 1991-2004 systems[9])	Efficiency: min.[1] Economizer: 1433[2,4] (except for certain pre-1991 systems[8] and certain 1991-2004 systems[9])
7. Cooling Tower	Efficiency: min.[1] Economizer: 1433[2]	No requirements	Option A	Option A
8. Air-Cooled Chiller	Efficiency: min.[1] Economizer: 1433[2]	Efficiency: + 5%[11] Economizer: shall not decrease existing economizer capacity	Efficiency (two of two): (1) + 10%[12] and (2) multistage Economizer: shall not decrease existing economizer capacity	Efficiency: min.[1] Economizer: 1433[2,4]
9. Water-Cooled Chiller	Efficiency: min.[1] Economizer: 1433[2]	Efficiency (one of two): (1) + 10%[13] or (2) plate frame heat exchanger[15] Economizer: shall not decrease existing economizer capacity	Efficiency (two of two): (1) + 15%[14] and (2) plate frame heat exchanger[15] Economizer: shall not decrease existing economizer capacity	Efficiency: min.[1] Economizer: 1433[2,4]

Unit Type	Option A Any alteration with new or replacement equipment	Option B (alternate to A) Replacement unit of the same type with the same or smaller output capacity	Option C (alternate to A) Replacement unit of the same type with a larger output capacity	Option D (alternate to A) New equipment added to existing system or replacement unit of a different type
10. Boiler	Efficiency: min.[1] Economizer: 1433[2]	Efficiency: + 8%[16] Economizer: shall not decrease existing economizer capacity	Efficiency: + 8%[16] Economizer: shall not decrease existing economizer capacity	Efficiency: min.[1] Economizer: 1433[2,4]

1. Minimum equipment efficiency shall comply with Section 1411.1 and Tables 14-1A through M.
2. System and building shall comply with Section 1433 (including both the individual unit size limits and the total building capacity limits on units without economizer). It is acceptable to comply using one of the exceptions to Section 1433.
3. All equipment replaced in an existing building shall have air economizer complying with Sections 1413 and 1433 unless both the individual unit size and the total capacity of units without air economizer in the building is less than that allowed in Exception 1 to Section 1433.
4. All separate new equipment added to an existing building shall have air economizer complying with Sections 1413 and 1433 unless both the individual unit size and the total capacity of units without air economizer in the building is less than that allowed in Exception 1 to Section 1433.
5. Equipment shall have a capacity-weighted average cooling system efficiency:

a. For units with a cooling capacity below 54,000 Btu/h, a minimum of 10% greater than the requirements in Tables 14-1A and 14-1B (1.10 x values in Tables 14-1A and 14-1B).

b. For units with a cooling capacity of 54,000 Btu/h and greater, a minimum of 5% greater than the requirements in Tables 14-1A and 14-1B (1.05 x values in Tables 14-1A and 14-1B).

6. Minimum of 50% air economizer that is ducted in a fully enclosed path directly to every heat pump unit in each zone, except that ducts may terminate within 12 inches of the intake to an HVAC unit provided that they are physically fastened so that the outside air duct is directed into the unit intake. If this is an increase in the amount of outside air supplied to this unit, the outside air supply system shall be capable of providing this additional outside air and equipped with economizer control.
7. Have flow control valve to eliminate flow through the heat pumps that are not in operation with variable speed pumping control complying with Section 1432.2.2 for that heat pump.
   – When total capacity of units with flow control valves exceeds 15% of total system capacity, a variable frequency drive shall be installed on the main loop pump.
   – As an alternate to this requirement, have a capacity-weighted average cooling system efficiency that is 5% greater than the requirements in note 5 (i.e., a minimum of 15%/10% greater than the requirements in Tables 14-1A and 14-1B (1.15/1.10 x values in Tables 14-1A and 14-1B).)
8. Systems installed prior to 1991 without fully utilized capacity are allowed to comply with Option B, provided that the individual unit cooling capacity does not exceed 90,000 Btu/h.
9. Economizer not required for systems installed with water economizer plate and frame heat exchanger complying with previous codes between 1991 and June 2004, provided that the total fan coil load does not exceed the existing or added capacity of the heat exchangers.
10. For water-cooled process equipment where the manufacturer's specifications require colder temperatures than available with waterside economizer, that portion of the load is exempt from the economizer requirements.
11. The air-cooled chiller shall have an IPLV efficiency that is a minimum of 5% greater than the IPLV requirements in Table 14-1C (1.05 x IPLV values in Table 14-1C).
12. The air-cooled chiller shall:

a. Have an IPLV efficiency that is a minimum of 10% greater than the IPLV requirements in Table 14-1C (1.10 x IPLV values in Table 14-1C), and

b. Be multistage with a minimum of two compressors.

13. The water-cooled chiller shall have an NPLV efficiency that is a minimum of 10% greater than the NPLV requirements in Table 14-1K, Table 14-1L, or Table 14-1M (1.10 x NPLV values in Table 14-1K, Table 14-1L, or Table 14-1M).
14. The water-cooled chiller shall have an NPLV efficiency that is a minimum of 15% greater than the NPLV requirements in Table 14-1K, Table 14-1L, or Table 14-1M (1.15 x NPLV values in Table 14-1K, Table 14-1L, or Table 14-1M).
15. Economizer cooling shall be provided by adding a plate-frame heat exchanger on the waterside with a capacity that is a minimum of 20% of the chiller capacity at standard AHRI rating conditions.
16. The replacement boiler shall have an efficiency that is a minimum of 8% higher than the value in Table 14-1F (1.08 x value in Table 14-1F), except for electric boilers.

1132.3 Lighting and Motors: Where the use in a space changes from one use in Table 15-1 to another use in Table 15-1, the installed lighting wattage shall comply with Section 1521 or 1531.

Other tenant improvements, alterations or repairs where 60 percent or more of the fixtures in a space enclosed by walls or ceiling-height partitions are new shall comply with Sections 1531 and 1532. (Where this threshold is triggered, the areas of the affected spaces may be combined for lighting code compliance calculations.) Where less than 60 percent of the fixtures in a space enclosed by walls or ceiling-height partitions are new, the installed lighting wattage shall be maintained or reduced. Where 60 percent or more of the lighting fixtures in a suspended ceiling are new, and the existing insulation is on the suspended ceiling, the roof/ceiling assembly shall be insulated according to the provisions of Chapter 13 Section 1311.2.

Where new wiring is being installed to serve added fixtures and/or fixtures are being relocated to a new circuit, controls shall comply with Sections 1513.1 through 1513.5 and, as applicable, 1513.8. In addition, office areas less than 300 ft^2 enclosed by walls or ceiling-height partitions, and all meeting and conference rooms, and all school classrooms, shall be equipped with occupancy sensors that comply with Sections 1513.6 and 1513.8. Where a new lighting panel (or a moved lighting panel) with all new raceway and conductor wiring from the panel to the fixtures is being installed, controls shall also comply with the other requirements in Sections 1513.6 through 1513.8.

Where new walls or ceiling-height partitions are added to an existing space and create a new enclosed space, but the lighting fixtures are not being changed, other than being relocated, the new enclosed space shall have controls that comply with Sections 1513.1 through 1513.2, 1513.4, and 1513.6 through 1513.8.

Those motors which are altered or replaced shall comply with Section 1511.

[Statutory Authority: RCW 19.27A.025, 19.27A.045. 10-03-115, 10-13-113 and 10-22-056, § 51-11-1132, filed 1/20/10, 6/21/10 and 10/28/10, effective 1/1/11. Statutory Authority: RCW 19.27A.022, 19.27A.025, 19.27A.045, and chapters 19.27 and 34.05 RCW. 07-01-089, § 51-11-1132, filed

12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27A.025, 19.27A.045 and chapters 19.27, 19.27A, and 34.05 RCW. 05-01-013, § 51-11-1132, filed 12/2/04, effective 7/1/05. Statutory Authority: RCW 19.27A.025, 19.27A.045. 01-03-010, § 51-11-1132, filed 1/5/01, effective 7/1/01; 98-03-003, § 51-11-1132, filed 1/8/98, effective 7/1/98. Statutory Authority: RCW 19.27A.025. 93-21-052, § 51-11-1132, filed 10/18/93, effective 4/1/94.]

Reviser's note: Notice of Objection: The Joint Administrative Rules Review Committee (Committee) finds that, in adopting the 2009 proposed changes to the State Energy Code, Chapter 51-11 WAC, on November 20, 2009, the State Building Code Council (Council) failed to comply with all requirements of the law and failed to adequately respond to the Committee's request for additional economic impact and cost-benefit analyses prior to adoption.

On October 1, 2009, the Committee found that the Small Business Economic Impact Statement (SBEIS) for the proposed changes filed with the Code Reviser failed to comply with all requirements of law. The Committee requested that the Council conduct a cost-benefit analysis pursuant to RCW 34.05.328 and amend the SBEIS to provide additional economic impact information, including an estimate of the number of jobs that would be created or lost as a result of compliance with all the proposed rules, as required by RCW 19.85.040 (2)(d).

The Council provided the Committee with information and data on November 18, 2009. On December 2, 2009, the Committee found that the Council failed to adequately respond to the Committee's request for additional data. Specifically, the Committee found that the Council failed to amend the SBEIS to (a) estimate the number of jobs that would be created or lost as a result of compliance with the proposed changes; and (b) support the SBEIS with a detailed and rigorous costs analysis of the cumulative impact of all the changes. In addition, the Committee found that the Council failed to provide the Committee with a cost-benefit analysis of the proposed changes and pursuant to the requirements of RCW 34.05.328.

The Committee strongly supports a process that makes thoughtful and informed progress towards changes that result in improved energy efficiency in our buildings, wherever practicable. While the Council worked diligently, it is the opinion of the Committee that the Council did not fully develop and consider the economic impacts and costs versus benefits of these significant changes to our Energy Code. Furthermore, it is the opinion of the Committee that the Council and the Legislature need this information to fully evaluate the value, impacts, and consequences of the proposed codes, with due diligence to their respective fiduciary responsibilities, in order to create the best informed public policy.

As a result, the Committee recommends that the Governor suspend the adoption and implementation of the changes to the Energy Code, Chapter 51-11 WAC, adopted by the Council on November 20, 2009, until such time as a more adequate analysis has been completed and considered by the appropriate bodies.

For all of the above stated reasons, the Committee objects to the changes to the State Energy Code, Chapter 51-11 WAC, that were adopted by the Council on November 20, 2009, and hereby directs the Code Reviser, pursuant to RCW 34.05.640(4), to publish this Notice of Objection in the Washington State Register and along with any publication in the Washington Administrative Code of changes to Chapter 51-11 WAC that were adopted by the Council in 2009 and filed with the Code Reviser.

WAC 51-11-1133 Change of occupancy or use. Changes of occupancy or use shall comply with the following requirements:

a. Any unconditioned space that is altered to become semi-heated, cooled, or fully heated, or any semi-heated space that is altered to become cooled or fully heated space shall be required to be brought into full compliance with this Code.

b. Any nonresidential space which is converted to multifamily residential space shall be brought into full compliance with this Code.

c. Any multifamily residential space which is converted to nonresidential space shall be required to comply with all of the provisions of Sections 1130 through 1132 of this Code.

[Statutory Authority: RCW 19.27A.025, 19.27A.045. 10-03-115, 10-13-113 and 10-22-056, § 51-11-1133, filed 1/20/10, 6/21/10 and 10/28/10, effective 1/1/11; 98-03-003, § 51-11-1133, filed 1/8/98, effective 7/1/98. Statutory Authority: RCW 19.27A.025. 93-21-052, § 51-11-1133, filed 10/18/93, effective 4/1/94.]

Reviser's note: Notice of Objection: The Joint Administrative Rules Review Committee (Committee) finds that, in adopting the 2009 proposed changes to the State Energy Code, Chapter 51-11 WAC, on November 20, 2009, the State Building Code Council (Council) failed to comply with all requirements of the law and failed to adequately respond to the Committee's request for additional economic impact and cost-benefit analyses prior to adoption.

On October 1, 2009, the Committee found that the Small Business Economic Impact Statement (SBEIS) for the proposed changes filed with the Code Reviser failed to comply with all requirements of law. The Committee requested that the Council conduct a cost-benefit analysis pursuant to RCW 34.05.328 and amend the SBEIS to provide additional economic impact information, including an estimate of the number of jobs that would be created or lost as a result of compliance with all the proposed rules, as required by RCW 19.85.040 (2)(d).

The Council provided the Committee with information and data on November 18, 2009. On December 2, 2009, the Committee found that the Council failed to adequately respond to the Committee's request for additional data. Specifically, the Committee found that the Council failed to amend the SBEIS to (a) estimate the number of jobs that would be created or lost as a result of compliance with the proposed changes; and (b) support the SBEIS with a detailed and rigorous costs analysis of the cumulative impact of all the changes. In addition, the Committee found that the Council failed to provide the Committee with a cost-benefit analysis of the proposed changes and pursuant to the requirements of RCW 34.05.328.

The Committee strongly supports a process that makes thoughtful and informed progress towards changes that result in improved energy efficiency in our buildings, wherever practicable. While the Council worked diligently, it is the opinion of the Committee that the Council did not fully develop and consider the economic impacts and costs versus benefits of these significant changes to our Energy Code. Furthermore, it is the opinion of the Committee that the Council and the Legislature need this information to fully evaluate the value, impacts, and consequences of the proposed codes, with due diligence to their respective fiduciary responsibilities, in order to create the best informed public policy.

As a result, the Committee recommends that the Governor suspend the adoption and implementation of the changes to the Energy Code, Chapter 51-11 WAC, adopted by the Council on November 20, 2009, until such time as a more adequate analysis has been completed and considered by the appropriate bodies.

For all of the above stated reasons, the Committee objects to the changes to the State Energy Code, Chapter 51-11 WAC, that were adopted by the Council on November 20, 2009, and hereby directs the Code Reviser, pursuant to RCW 34.05.640(4), to publish this Notice of Objection in the Washington State Register and along with any publication in the Washington Administrative Code of changes to Chapter 51-11 WAC that were adopted by the Council in 2009 and filed with the Code Reviser.

WAC 51-11-1135 Commissioning. Commissioning in compliance with Sections 1416 and 1513.8 shall be required for new systems or modified portions of systems, with a heating capacity of 600,000 Btu/h or a cooling capacity of 40 tons or more.

[Statutory Authority: RCW 19.27A.025, 19.27A.045. 10-03-115, 10-13-113 and 10-22-056, § 51-11-1135, filed 1/20/10, 6/21/10 and 10/28/10, effective 1/1/11.]

Reviser's note: Notice of Objection: The Joint Administrative Rules Review Committee (Committee) finds that, in adopting the 2009 proposed changes to the State Energy Code, Chapter 51-11 WAC, on November 20, 2009, the State Building Code Council (Council) failed to comply with all requirements of the law and failed to adequately respond to the Committee's request for additional economic impact and cost-benefit analyses prior to adoption.

On October 1, 2009, the Committee found that the Small Business Economic Impact Statement (SBEIS) for the proposed changes filed with the Code Reviser failed to comply with all requirements of law. The Committee requested that the Council conduct a cost-benefit analysis pursuant to RCW 34.05.328 and amend the SBEIS to provide additional economic impact information, including an estimate of the number of jobs that would be cre-

ated or lost as a result of compliance with all the proposed rules, as required by RCW 19.85.040 (2)(d).

The Council provided the Committee with information and data on November 18, 2009. On December 2, 2009, the Committee found that the Council failed to adequately respond to the Committee's request for additional data. Specifically, the Committee found that the Council failed to amend the SBEIS to (a) estimate the number of jobs that would be created or lost as a result of compliance with the proposed changes; and (b) support the SBEIS with a detailed and rigorous costs analysis of the cumulative impact of all the changes. In addition, the Committee found that the Council failed to provide the Committee with a cost-benefit analysis of the proposed changes and pursuant to the requirements of RCW 34.05.328.

The Committee strongly supports a process that makes thoughtful and informed progress towards changes that result in improved energy efficiency in our buildings, wherever practicable. While the Council worked diligently, it is the opinion of the Committee that the Council did not fully develop and consider the economic impacts and costs versus benefits of these significant changes to our Energy Code. Furthermore, it is the opinion of the Committee that the Council and the Legislature need this information to fully evaluate the value, impacts, and consequences of the proposed codes, with due diligence to their respective fiduciary responsibilities, in order to create the best informed public policy.

As a result, the Committee recommends that the Governor suspend the adoption and implementation of the changes to the Energy Code, Chapter 51-11 WAC, adopted by the Council on November 20, 2009, until such time as a more adequate analysis has been completed and considered by the appropriate bodies.

For all of the above stated reasons, the Committee objects to the changes to the State Energy Code, Chapter 51-11 WAC, that were adopted by the Council on November 20, 2009, and hereby directs the Code Reviser, pursuant to RCW 34.05.640(4), to publish this Notice of Objection in the Washington State Register and along with any publication in the Washington Administrative Code of changes to Chapter 51-11 WAC that were adopted by the Council in 2009 and filed with the Code Reviser.

WAC 51-11-1141 Plans and specifications.

1141.1 General: If required by the building official, plans and specifications shall be submitted in support of an application for a building permit. If required by the building official, plans and specifications shall be stamped and authenticated by a registered design professional currently licensed in the state of Washington. All plans and specifications, together with supporting data, shall be submitted to the building official prior to issuance of a building permit.

1141.2 Details: The plans and specifications shall show in sufficient detail all pertinent data and features of the building and the equipment and systems as herein governed including, but not limited to: Design criteria; exterior envelope component materials, U-factors of the envelope systems, R-values of insulating materials; U-factors and shading coefficients of glazing; area weighted U-factor calculations; efficiency, economizer, size and type of apparatus and equipment; fan system horsepower; equipment and systems controls; lighting fixture schedule with wattages and controls narrative; commissioning requirements for HVAC equipment, HVAC controls, and lighting controls, and other pertinent data to indicate compliance with the requirements of this Code.

1141.3 Alternate Materials and Method of Construction: The provisions of this Code are not intended to prevent the use of any material, method of construction, design or insulating system not specifically prescribed herein, provided that such construction, design or insulating system has been approved by the building official as meeting the intent of this Code. The building official may approve any such alternate provided the proposed alternate meets or exceeds the provisions of this Code and that the material, method, design or work offered is for the purpose intended, at least the equivalent of that prescribed in this Code, in quality, strength, effectiveness, fire-resistance, durability, safety, and energy efficiency. The building official may require that sufficient evidence of proof be submitted to substantiate any claims that may be made regarding performance capabilities.

1141.4 Systems Analysis Approach for the Entire Building: In lieu of using Chapters 12 through 20, compliance may be demonstrated using the systems analysis option in RS-29. When using systems analysis, the proposed building shall provide equal or better conservation of energy than the standard design as defined in RS-29. If required by the building official, all energy comparison calculations submitted under the provisions of RS-29 shall be stamped and authenticated by an engineer or architect licensed to practice by the state of Washington.

1141.5 Commissioning Details/Specifications: When required by the building official, the plans submitted in support of a building permit shall include a list of the functional tests required to comply with commissioning in accordance with Sections 1416 and 1513.8 as well as the name of the commissioning agent for buildings over 50,000 square feet.

[Statutory Authority: RCW 19.27A.025, 19.27A.045. 10-03-115, 10-13-113 and 10-22-056, § 51-11-1141, filed 1/20/10, 6/21/10 and 10/28/10, effective 1/1/11. Statutory Authority: RCW 19.27A.025. 93-21-052, § 51-11-1141, filed 10/18/93, effective 4/1/94.]

Reviser's note: Notice of Objection: The Joint Administrative Rules Review Committee (Committee) finds that, in adopting the 2009 proposed changes to the State Energy Code, Chapter 51-11 WAC, on November 20, 2009, the State Building Code Council (Council) failed to comply with all requirements of the law and failed to adequately respond to the Committee's request for additional economic impact and cost-benefit analyses prior to adoption.

On October 1, 2009, the Committee found that the Small Business Economic Impact Statement (SBEIS) for the proposed changes filed with the Code Reviser failed to comply with all requirements of law. The Committee requested that the Council conduct a cost-benefit analysis pursuant to RCW 34.05.328 and amend the SBEIS to provide additional economic impact information, including an estimate of the number of jobs that would be created or lost as a result of compliance with all the proposed rules, as required by RCW 19.85.040 (2)(d).

The Council provided the Committee with information and data on November 18, 2009. On December 2, 2009, the Committee found that the Council failed to adequately respond to the Committee's request for additional data. Specifically, the Committee found that the Council failed to amend the SBEIS to (a) estimate the number of jobs that would be created or lost as a result of compliance with the proposed changes; and (b) support the SBEIS with a detailed and rigorous costs analysis of the cumulative impact of all the changes. In addition, the Committee found that the Council failed to provide the Committee with a cost-benefit analysis of the proposed changes and pursuant to the requirements of RCW 34.05.328.

The Committee strongly supports a process that makes thoughtful and informed progress towards changes that result in improved energy efficiency in our buildings, wherever practicable. While the Council worked diligently, it is the opinion of the Committee that the Council did not fully develop and consider the economic impacts and costs versus benefits of these significant changes to our Energy Code. Furthermore, it is the opinion of the Committee that the Council and the Legislature need this information to fully evaluate the value, impacts, and consequences of the proposed codes, with due diligence to their respective fiduciary responsibilities, in order to create the best informed public policy.

As a result, the Committee recommends that the Governor suspend the adoption and implementation of the changes to the Energy Code, Chapter 51-11 WAC, adopted by the Council on November 20, 2009, until such time as a more adequate analysis has been completed and considered by the appropriate bodies.

For all of the above stated reasons, the Committee objects to the changes to the State Energy Code, Chapter 51-11 WAC, that were adopted

by the Council on November 20, 2009, and hereby directs the Code Reviser, pursuant to RCW 34.05.640(4), to publish this Notice of Objection in the Washington State Register and along with any publication in the Washington Administrative Code of changes to Chapter 51-11 WAC that were adopted by the Council in 2009 and filed with the Code Reviser.

WAC 51-11-1200 Section 1201—General. All buildings shall comply with Chapter 12. Whole building energy supply sources shall be metered to supply energy consumption data to the building owner to effectively manage energy. The building shall have a totalizing meter for each energy source.

1202 Whole Building Energy Supply Metering. Meters with remote metering capability or automatic meter reading (AMR) capability shall be provided to collect energy use data for each energy supply source to the building including gas, electricity and district stream, that exceeds the thresholds listed in Table 12-1. Utility company service entrance/interval meters are allowed to be used provided that they are configured for automatic meter reading (AMR) capability.

TABLE 12-1
Energy Source Meter Thresholds

Energy Source	Main Metering Threshold
Electrical service	> 500 kVA
On-site renewable electric power	> 10 kVA (peak)
Gas and steam service	> 300 kW (1,000,000 Btu/h)
Geothermal	> 300 kW (1,000,000 Btu/h) heating
On-site renewable thermal energy	> 10 kW (30,000 Btu/h)

Master submetering with remote metering capability (including current sensors or flow meters) shall be provided for the systems that exceed the thresholds in Table 12-1 to collect overall totalized energy use data for each subsystem in accordance with Table 12-2.

TABLE 12-2
Component Energy Master Submetering Thresholds

Component	Submetering Threshold
Chillers/heat pump systems	> 70 kW (240,000 Btu/h) cooling capacity
Packaged AC unit systems	> 70 kW (240,000 Btu/h) cooling capacity
HVAC fan systems	> 15 kW (20 hp)
Exhaust fan systems	> 15 kW (20 hp)
Make-up air fan systems	> 15 kW (20 hp)
Pump systems	> 15 kW (20 hp)
Cooling towers systems	> 15 kW (20 hp)
Boilers, furnaces and other heating equipment systems	> 300 kW (1,000,000 Btu/h) heating capacity
General lighting circuits	> 15 kVA
Miscellaneous electric loads	> 15 kVA

Metering shall be digital-type meters for the main meter. Current sensors or flow meters are allowed for submetering. For subsystems with multiple similar units, such as multicell cooling towers, only one meter is required for the subsystem. Existing buildings are allowed to reuse installed existing analog-type utility company service/interval meters.

1203 Metering: Where new or replacement systems or equipment is installed that exceeds the threshold in Table 12-1 or Table 12-2, metering shall be installed for that system or equipment in accordance with Section 1201.

[Statutory Authority: RCW 19.27A.025, 19.27A.045. 10-03-115, 10-13-113 and 10-22-056, § 51-11-1200, filed 1/20/10, 6/21/10 and 10/28/10, effective 1/1/11.]

Reviser's note: Notice of Objection: The Joint Administrative Rules Review Committee (Committee) finds that, in adopting the 2009 proposed changes to the State Energy Code, Chapter 51-11 WAC, on November 20, 2009, the State Building Code Council (Council) failed to comply with all requirements of the law and failed to adequately respond to the Committee's request for additional economic impact and cost-benefit analyses prior to adoption.

On October 1, 2009, the Committee found that the Small Business Economic Impact Statement (SBEIS) for the proposed changes filed with the Code Reviser failed to comply with all requirements of law. The Committee requested that the Council conduct a cost-benefit analysis pursuant to RCW 34.05.328 and amend the SBEIS to provide additional economic impact information, including an estimate of the number of jobs that would be created or lost as a result of compliance with all the proposed rules, as required by RCW 19.85.040 (2)(d).

The Council provided the Committee with information and data on November 18, 2009. On December 2, 2009, the Committee found that the Council failed to adequately respond to the Committee's request for additional data. Specifically, the Committee found that the Council failed to amend the SBEIS to (a) estimate the number of jobs that would be created or lost as a result of compliance with the proposed changes; and (b) support the SBEIS with a detailed and rigorous costs analysis of the cumulative impact of all the changes. In addition, the Committee found that the Council failed to provide the Committee with a cost-benefit analysis of the proposed changes and pursuant to the requirements of RCW 34.05.328.

The Committee strongly supports a process that makes thoughtful and informed progress towards changes that result in improved energy efficiency in our buildings, wherever practicable. While the Council worked diligently, it is the opinion of the Committee that the Council did not fully develop and consider the economic impacts and costs versus benefits of these significant changes to our Energy Code. Furthermore, it is the opinion of the Committee that the Council and the Legislature need this information to fully evaluate the value, impacts, and consequences of the proposed codes, with due diligence to their respective fiduciary responsibilities, in order to create the best informed public policy.

As a result, the Committee recommends that the Governor suspend the adoption and implementation of the changes to the Energy Code, Chapter 51-11 WAC, adopted by the Council on November 20, 2009, until such time as a more adequate analysis has been completed and considered by the appropriate bodies.

For all of the above stated reasons, the Committee objects to the changes to the State Energy Code, Chapter 51-11 WAC, that were adopted by the Council on November 20, 2009, and hereby directs the Code Reviser, pursuant to RCW 34.05.640(4), to publish this Notice of Objection in the Washington State Register and along with any publication in the Washington Administrative Code of changes to Chapter 51-11 WAC that were adopted by the Council in 2009 and filed with the Code Reviser.

WAC 51-11-1310 General requirements. The building envelope shall comply with Sections 1311 through 1314.

1310.1 Conditioned Spaces: The building envelope for conditioned spaces shall also comply with one of the following paths:

a. Prescriptive Building Envelope Option Sections 1320 through 1323.

b. Component Performance Building Envelope Option Sections 1330 through 1334.

c. Systems Analysis. See Section 1141.4.

1310.2 Semi-Heated Spaces: All spaces shall be considered conditioned spaces, and shall comply with the requirements in Section 1310.1 unless they meet the following criteria for semi-heated spaces. The installed heating equipment output, in Climate Zone 1, shall be 3 Btu/(h•ft^2) or greater but not greater than 8 Btu/(h•ft^2) and in Climate Zone 2, shall be 5 Btu/(h•ft^2) or greater but not greater than 12 Btu/(h•ft^2).

For semi-heated spaces, the building envelope shall comply with the same requirements as that for conditioned spaces in Section 1310.1; however, semi-heated spaces shall be calculated separately from other conditioned spaces for compliance purposes.

EXCEPTION: For semi-heated spaces heated by other fuels only, wall insulation is not required for those walls that separate semi-heated spaces (see definition in Section 201.1) from the exterior provided that the space is heated solely by a heating system controlled by a thermostat with a maximum set point capacity of 45°F, mounted no lower than the heating unit.

1310.3 Cold Storage and Refrigerated Spaces: Exterior and interior surfaces of frozen storage spaces or cold storage spaces in refrigerated warehouses may comply with either the prescriptive or component performance approach using insulation values in Table 13-3. The remainder of refrigerated warehouse area containing conditioned or semi-conditioned spaces shall comply by using either the prescriptive or component performance approach using Tables 13-1 and 13-2.

EXCEPTIONS: 1. Areas within refrigerated warehouses that are designed solely for the purpose of quick chilling or freezing of products with design cooling capacities of greater than 240 Btu/hr-ft^2 (2 tons per 100 ft^2).
2. Controlled atmosphere storage exterior floor and partition wall insulation.

Table 13-3
Refrigerated Warehouse Insulation

SPACE	SURFACE	MINIMUM R-VALUE (°F-hr-ft^2/Btu)
Frozen Storage Spaces (28°F or below)	Exterior Roof/Ceiling	R-36
	Exterior Wall	R-36
	Exterior Floor	R-36
	Interior Partition[1]	R-28
Cold Storage Spaces (28°-45°F)	Exterior Roof/Ceiling	R-28
	Exterior Wall	R-28
	Interior Partition[1]	R-19

[1]Interior partitions include any wall, floor, or ceiling that divides frozen storage spaces or cold storage spaces from each other, conditioned spaces, unconditioned spaces, or semi-conditioned spaces.

Figure 13A
Building Envelope Compliance Options

Section Number	Subject	Prescriptive Option	Component Performance Option	Systems Analysis Option
1310	General Requirements	X	X	X
1311	Insulation	X	X	X
1312	Glazing and Doors	X	X	X
1313	Moisture Control	X	X	X
1314	Air Leakage	X	X	X
1320	Prescriptive Building Envelope Option	X		
1321	General	X		
1322	Opaque Envelope	X		
1323	Glazing	X		
1330	Component Performance Building Envelope Option		X	
1331	General		X	
1332	Component U-Factors		X	
1333	UA Calculations		X	
1334	Solar Heat Gain Coefficient		X	
RS-29	Systems Analysis			X

[Statutory Authority: RCW 19.27A.025, 19.27A.045. 10-03-115, 10-13-113 and 10-22-056, § 51-11-1310, filed 1/20/10, 6/21/10 and 10/28/10, effective 1/1/11. Statutory Authority: RCW 19.27A.022, 19.27A.025, 19.27A.045, and chapters 19.27 and 34.05 RCW. 07-01-089, § 51-11-1310, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27A.025. 93-21-052, § 51-11-1310, filed 10/18/93, effective 4/1/94.]

Reviser's note: Notice of Objection: The Joint Administrative Rules Review Committee (Committee) finds that, in adopting the 2009 proposed changes to the State Energy Code, Chapter 51-11 WAC, on November 20, 2009, the State Building Code Council (Council) failed to comply with all requirements of the law and failed to adequately respond to the Committee's request for additional economic impact and cost-benefit analyses prior to adoption.

On October 1, 2009, the Committee found that the Small Business Economic Impact Statement (SBEIS) for the proposed changes filed with the Code Reviser failed to comply with all requirements of law. The Committee requested that the Council conduct a cost-benefit analysis pursuant to RCW 34.05.328 and amend the SBEIS to provide additional economic impact information, including an estimate of the number of jobs that would be created or lost as a result of compliance with all the proposed rules, as required by RCW 19.85.040 (2)(d).

The Council provided the Committee with information and data on November 18, 2009. On December 2, 2009, the Committee found that the Council failed to adequately respond to the Committee's request for additional data. Specifically, the Committee found that the Council failed to amend the SBEIS to (a) estimate the number of jobs that would be created or lost as a result of compliance with the proposed changes; and (b) support the SBEIS with a detailed and rigorous costs analysis of the cumulative impact of all the changes. In addition, the Committee found that the Council failed to provide the Committee with a cost-benefit analysis of the proposed changes and pursuant to the requirements of RCW 34.05.328.

The Committee strongly supports a process that makes thoughtful and informed progress towards changes that result in improved energy efficiency in our buildings, wherever practicable. While the Council worked diligently, it is the opinion of the Committee that the Council did not fully develop and consider the economic impacts and costs versus benefits of these significant changes to our Energy Code. Furthermore, it is the opinion of the Committee that the Council and the Legislature need this information to fully evaluate the value, impacts, and consequences of the proposed codes, with due diligence to their respective fiduciary responsibilities, in order to create the best informed public policy.

As a result, the Committee recommends that the Governor suspend the adoption and implementation of the changes to the Energy Code, Chapter 51-11 WAC, adopted by the Council on November 20, 2009, until such time as a more adequate analysis has been completed and considered by the appropriate bodies.

For all of the above stated reasons, the Committee objects to the changes to the State Energy Code, Chapter 51-11 WAC, that were adopted by the Council on November 20, 2009, and hereby directs the Code Reviser, pursuant to RCW 34.05.640(4), to publish this Notice of Objection in the Washington State Register and along with any publication in the Washington Administrative Code of changes to Chapter 51-11 WAC that were adopted by the Council in 2009 and filed with the Code Reviser.

WAC 51-11-1311 Insulation.

1311.1 Installation Requirements: All insulation materials shall be installed according to the manufacturer's instructions to achieve proper densities, maintain clearances, and maintain uniform R-values. To the maximum extent possible, insulation shall extend over the full component area to the intended R-value.

1311.2 Roof/Ceiling Insulation: Where two or more layers of rigid board insulation are used in a roof assembly, the vertical joints between each layer shall be staggered. Open-blown or poured loose-fill insulation may be used in attic spaces where the slope of the ceiling is not more than three feet in twelve and there is at least thirty inches of clear distance from the top of the bottom chord of the truss or ceiling joist to the underside of the sheathing at the roof ridge. When eave vents are installed, baffling of the vent openings shall be provided so as to deflect the incoming air above the surface of the insulation.

Where lighting fixtures are recessed into a suspended or exposed grid ceiling, the roof/ceiling assembly shall be insulated in a location other than directly on the suspended ceiling.

EXCEPTION: Type IC rated recessed lighting fixtures.

Where installed in wood framing, faced batt insulation shall be face stapled.

1311.3 Wall Insulation: Exterior wall cavities isolated during framing shall be fully insulated to the levels of the surrounding walls. When installed in wood framing, faced batt insulation shall be face stapled.

Above grade exterior insulation shall be protected.

1311.4 Floor Insulation: Floor insulation shall be installed in a permanent manner in substantial contact with the surface being insulated. Insulation supports shall be installed so spacing is not more than twenty-four inches on center. Installed insulation shall not block the airflow through foundation vents.

1311.5 Slab-On-Grade Floor: Slab-on-grade insulation installed inside the foundation wall shall extend downward from the top of the slab a minimum distance of twenty-four inches or to the top of the footing, whichever is less. Insulation installed outside the foundation shall extend downward a minimum of twenty-four inches or to the frostline, whichever is greater. Above grade insulation shall be protected.

EXCEPTION: For monolithic slabs, the insulation shall extend downward from the top of the slab to the bottom of the footing.

1311.6 Radiant Floors (on or below grade): Slab-on-grade insulation shall extend downward from the top of the slab a minimum distance of thirty-six inches or downward to the top of the footing and horizontal for an aggregate of not less than thirty-six inches.

If required by the building official where soil conditions warrant such insulation, the entire area of a radiant floor shall be thermally isolated from the soil. Where a soil gas control system is provided below the radiant floor, which results in increased convective flow below the radiant floor, the radiant floor shall be thermally isolated from the sub-floor gravel layer.

[Statutory Authority: RCW 19.27A.025, 19.27A.045. 10-03-115, 10-13-113 and 10-22-056, § 51-11-1311, filed 1/20/10, 6/21/10 and 10/28/10, effective 1/1/11. Statutory Authority: RCW 19.27A.025. 93-21-052, § 51-11-1311, filed 10/18/93, effective 4/1/94.]

Reviser's note: Notice of Objection: The Joint Administrative Rules Review Committee (Committee) finds that, in adopting the 2009 proposed changes to the State Energy Code, Chapter 51-11 WAC, on November 20, 2009, the State Building Code Council (Council) failed to comply with all requirements of the law and failed to adequately respond to the Committee's request for additional economic impact and cost-benefit analyses prior to adoption.

On October 1, 2009, the Committee found that the Small Business Economic Impact Statement (SBEIS) for the proposed changes filed with the Code Reviser failed to comply with all requirements of law. The Committee requested that the Council conduct a cost-benefit analysis pursuant to RCW 34.05.328 and amend the SBEIS to provide additional economic impact information, including an estimate of the number of jobs that would be created or lost as a result of compliance with all the proposed rules, as required by RCW 19.85.040 (2)(d).

The Council provided the Committee with information and data on November 18, 2009. On December 2, 2009, the Committee found that the Council failed to adequately respond to the Committee's request for additional data. Specifically, the Committee found that the Council failed to amend the SBEIS to (a) estimate the number of jobs that would be created or lost as a result of compliance with the proposed changes; and (b) support the SBEIS with a detailed and rigorous costs analysis of the cumulative impact of all the changes. In addition, the Committee found that the Council failed to provide the Committee with a cost-benefit analysis of the proposed changes and pursuant to the requirements of RCW 34.05.328.

The Committee strongly supports a process that makes thoughtful and informed progress towards changes that result in improved energy efficiency in our buildings, wherever practicable. While the Council worked diligently, it is the opinion of the Committee that the Council did not fully develop and consider the economic impacts and costs versus benefits of these significant changes to our Energy Code. Furthermore, it is the opinion of the Committee that the Council and the Legislature need this information to fully evaluate the value, impacts, and consequences of the proposed codes, with due diligence to their respective fiduciary responsibilities, in order to create the best informed public policy.

As a result, the Committee recommends that the Governor suspend the adoption and implementation of the changes to the Energy Code, Chapter 51-11 WAC, adopted by the Council on November 20, 2009, until such time as a more adequate analysis has been completed and considered by the appropriate bodies.

For all of the above stated reasons, the Committee objects to the changes to the State Energy Code, Chapter 51-11 WAC, that were adopted by the Council on November 20, 2009, and hereby directs the Code Reviser, pursuant to RCW 34.05.640(4), to publish this Notice of Objection in the Washington State Register and along with any publication in the Washington Administrative Code of changes to Chapter 51-11 WAC that were adopted by the Council in 2009 and filed with the Code Reviser.

WAC 51-11-1312 Glazing and doors.

1312.1 Standard Procedure for Determination of Glazing and Door U-Factors: U-Factors for glazing and doors shall be determined, certified and labeled in accordance with Standard RS-31 by a certified independent agency licensed by the

National Fenestration Rating Council (NFRC). Compliance shall be based on the Residential or the Nonresidential Model Size. Product samples used for U-factor determinations shall be production line units or representative of units as purchased by the consumer or contractor. Unlabeled glazing and doors shall be assigned the default U-factor in Table 10-6.

1312.2 Solar Heat Gain Coefficient and Shading Coefficient: Solar Heat Gain Coefficient (SHGC), shall be determined, certified and labeled in accordance with the National Fenestration Rating Council (NFRC) Standard by a certified, independent agency, licensed by the NFRC.

EXCEPTION: Shading coefficients (SC) shall be an acceptable alternate for compliance with solar heat gain coefficient requirements. Shading coefficients for glazing shall be taken from Chapter 15 of RS-1 or from the manufacturer's test data.

[Statutory Authority: RCW 19.27A.025, 19.27A.045. 10-03-115, 10-13-113 and 10-22-056, § 51-11-1312, filed 1/20/10, 6/21/10 and 10/28/10, effective 1/1/11. Statutory Authority: RCW 19.27A.022, 19.27A.025, 19.27A.045, and chapters 19.27 and 34.05 RCW. 07-01-089, § 51-11-1312, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27A.025, 19.27A.045. 01-03-010, § 51-11-1312, filed 1/5/01, effective 7/1/01; 98-03-003, § 51-11-1312, filed 1/8/98, effective 7/1/98. Statutory Authority: RCW 19.27A.025. 93-21-052, § 51-11-1312, filed 10/18/93, effective 4/1/94.]

Reviser's note: Notice of Objection: The Joint Administrative Rules Review Committee (Committee) finds that, in adopting the 2009 proposed changes to the State Energy Code, Chapter 51-11 WAC, on November 20, 2009, the State Building Code Council (Council) failed to comply with all requirements of the law and failed to adequately respond to the Committee's request for additional economic impact and cost-benefit analyses prior to adoption.

On October 1, 2009, the Committee found that the Small Business Economic Impact Statement (SBEIS) for the proposed changes filed with the Code Reviser failed to comply with all requirements of law. The Committee requested that the Council conduct a cost-benefit analysis pursuant to RCW 34.05.328 and amend the SBEIS to provide additional economic impact information, including an estimate of the number of jobs that would be created or lost as a result of compliance with all the proposed rules, as required by RCW 19.85.040 (2)(d).

The Council provided the Committee with information and data on November 18, 2009. On December 2, 2009, the Committee found that the Council failed to adequately respond to the Committee's request for additional data. Specifically, the Committee found that the Council failed to amend the SBEIS to (a) estimate the number of jobs that would be created or lost as a result of compliance with the proposed changes; and (b) support the SBEIS with a detailed and rigorous costs analysis of the cumulative impact of all the changes. In addition, the Committee found that the Council failed to provide the Committee with a cost-benefit analysis of the proposed changes and pursuant to the requirements of RCW 34.05.328.

The Committee strongly supports a process that makes thoughtful and informed progress towards changes that result in improved energy efficiency in our buildings, wherever practicable. While the Council worked diligently, it is the opinion of the Committee that the Council did not fully develop and consider the economic impacts and costs versus benefits of these significant changes to our Energy Code. Furthermore, it is the opinion of the Committee that the Council and the Legislature need this information to fully evaluate the value, impacts, and consequences of the proposed codes, with due diligence to their respective fiduciary responsibilities, in order to create the best informed public policy.

As a result, the Committee recommends that the Governor suspend the adoption and implementation of the changes to the Energy Code, Chapter 51-11 WAC, adopted by the Council on November 20, 2009, until such time as a more adequate analysis has been completed and considered by the appropriate bodies.

For all of the above stated reasons, the Committee objects to the changes to the State Energy Code, Chapter 51-11 WAC, that were adopted by the Council on November 20, 2009, and hereby directs the Code Reviser, pursuant to RCW 34.05.640(4), to publish this Notice of Objection in the Washington State Register and along with any publication in the Washington Administrative Code of changes to Chapter 51-11 WAC that were adopted by the Council in 2009 and filed with the Code Reviser.

WAC 51-11-1313 Moisture control.

1313.1 Vapor Retarders: Vapor retarders shall be installed on the warm side (in winter) of insulation as required by this section.

EXCEPTION: Vapor retarder installed with not more than 1/3 of the nominal R-value between it and the conditioned space.

1313.2 Roof/Ceiling Assemblies: Roof/ceiling assemblies where the ventilation space above the insulation is less than an average of twelve inches shall be provided with a vapor retarder. (For enclosed attics and enclosed rafter spaces see Section 1203.2 of the International Building Code.) Roof/ceiling assemblies without a vented airspace, allowed only where neither the roof deck nor the roof structure are made of wood, shall provide a continuous vapor retarder with taped seams.

EXCEPTIONS:
1. Vapor retarders need not be provided where all of the insulation is installed between the roof membrane and the structural roof deck.
2. Unvented attic assemblies (spaces between the ceiling joists of the top story and the roof rafters) shall be permitted if all the following conditions are met:
2.1. The unvented attic space is completely contained within the building thermal envelope.
2.2. No interior vapor retarders are installed on the ceiling side (attic floor) of the unvented attic assembly.
2.3. Where wood shingles or shakes are used, a minimum 1/4 inch (6 mm) vented air space separates the shingles or shakes and the roofing underlayment above the structural sheathing.
2.4. Any air-impermeable insulation shall be a vapor retarder, or shall have a vapor retarder coating or covering in direct contact with the underside of the insulation.
2.5. Either Items a, b or c shall be met, depending on the air permeability of the insulation directly under the structural roof sheathing.
a. Air-impermeable insulation only. Insulation shall be applied in direct contact to the underside of the structural roof sheathing.
b. Air-permeable insulation only. In addition to the air-permeable insulation installed directly below the structural sheathing, rigid board or sheet insulation shall be installed directly above the structural roof sheathing as specified per WA Climate Zone for condensation control.
i. Climate Zone #1 R-10 minimum rigid board or air-impermeable insulation R-value.
ii. Climate Zone #2 R-25 minimum rigid board or air-impermeable insulation R-value.
c. Air-impermeable and air-permeable insulation. The air-impermeable insulation shall be applied in direct contact to the underside of the structural roof sheathing as specified per WA Climate Zone for condensation control. The air-permeable insulation shall be installed directly under the air-impermeable insulation.
i. Climate Zone #1 R-10 minimum rigid board or air-impermeable insulation R-value.
ii. Climate Zone #2 R-25 minimum rigid board or air-impermeable insulation R-value.

1313.3 Walls: Walls separating conditioned space from unconditioned space shall be provided with a vapor retarder.

1313.4 Floors: Floors separating conditioned space from unconditioned space shall be provided with a vapor retarder.

1313.5 Crawl Spaces: A ground cover of six mil (0.006 inch thick) black polyethylene or approved equal shall be laid over the ground within crawl spaces. The ground cover shall be overlapped twelve inches minimum at the joints and shall extend to the foundation wall.

EXCEPTION: The ground cover may be omitted in crawl spaces if the crawl space has a concrete slab floor with a minimum thickness of three and one-half inches.

[Statutory Authority: RCW 19.27A.025, 19.27A.045. 10-03-115, 10-13-113 and 10-22-056, § 51-11-1313, filed 1/20/10, 6/21/10 and 10/28/10, effective 1/1/11. Statutory Authority: RCW 19.27A.020, 19.27A.045. 04-01-106, § 51-11-1313, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27A.025, 19.27A.045. 01-03-010, § 51-11-1313, filed 1/5/01, effective 7/1/01. Statutory Authority: RCW 19.27A.025. 93-21-052, § 51-11-1313, filed 10/18/93, effective 4/1/94.]

Reviser's note: Notice of Objection: The Joint Administrative Rules Review Committee (Committee) finds that, in adopting the 2009 proposed changes to the State Energy Code, Chapter 51-11 WAC, on November 20, 2009, the State Building Code Council (Council) failed to comply with all requirements of the law and failed to adequately respond to the Committee's request for additional economic impact and cost-benefit analyses prior to adoption.

On October 1, 2009, the Committee found that the Small Business Economic Impact Statement (SBEIS) for the proposed changes filed with the Code Reviser failed to comply with all requirements of law. The Committee requested that the Council conduct a cost-benefit analysis pursuant to RCW 34.05.328 and amend the SBEIS to provide additional economic impact information, including an estimate of the number of jobs that would be created or lost as a result of compliance with all the proposed rules, as required by RCW 19.85.040 (2)(d).

The Council provided the Committee with information and data on November 18, 2009. On December 2, 2009, the Committee found that the Council failed to adequately respond to the Committee's request for additional data. Specifically, the Committee found that the Council failed to amend the SBEIS to (a) estimate the number of jobs that would be created or lost as a result of compliance with the proposed changes; and (b) support the SBEIS with a detailed and rigorous costs analysis of the cumulative impact of all the changes. In addition, the Committee found that the Council failed to provide the Committee with a cost-benefit analysis of the proposed changes and pursuant to the requirements of RCW 34.05.328.

The Committee strongly supports a process that makes thoughtful and informed progress towards changes that result in improved energy efficiency in our buildings, wherever practicable. While the Council worked diligently, it is the opinion of the Committee that the Council did not fully develop and consider the economic impacts and costs versus benefits of these significant changes to our Energy Code. Furthermore, it is the opinion of the Committee that the Council and the Legislature need this information to fully evaluate the value, impacts, and consequences of the proposed codes, with due diligence to their respective fiduciary responsibilities, in order to create the best informed public policy.

As a result, the Committee recommends that the Governor suspend the adoption and implementation of the changes to the Energy Code, Chapter 51-11 WAC, adopted by the Council on November 20, 2009, until such time as a more adequate analysis has been completed and considered by the appropriate bodies.

For all of the above stated reasons, the Committee objects to the changes to the State Energy Code, Chapter 51-11 WAC, that were adopted by the Council on November 20, 2009, and hereby directs the Code Reviser, pursuant to RCW 34.05.640(4), to publish this Notice of Objection in the Washington State Register and along with any publication in the Washington Administrative Code of changes to Chapter 51-11 WAC that were adopted by the Council in 2009 and filed with the Code Reviser.

WAC 51-11-1314 Air leakage.

1314.1 Building Envelope Sealing: The following areas of the building envelope shall be sealed, caulked, gasketed, or weather-stripped to minimize air leakage:

a. Joints around fenestration and door frames;

b. Junctions between walls and foundations, between walls at building corners, between walls and structural floors or roofs, and between walls and roof or roof panels;

c. Openings at penetrations of utility services through the roofs, walls, and floors;

d. Site-built fenestration and doors;

e. Building assemblies used as ducts or plenums;

f. Joints, seams, and penetrations of vapor retarders;

g. All other openings in the building envelope.

1314.2 Glazing and Doors: Air leakage for fenestration and doors shall be determined in accordance with NFRC 400 or AAMA/WDMA/CSA 101/I.S.2/A440 or ASTM E283 as specified below. Air leakage shall be determined by a laboratory accredited by a nationally recognized accreditation organization, such as the National Fenestration Rating Council, and shall be labeled and certified by the manufacturer. Air leakage shall not exceed:

a. 1.0 cfm/ft^2 for glazed swinging entrance doors and revolving doors, tested at a pressure of at least 1.57 pounds per square foot (psf) in accordance with NFRC 400, AAMA/WDMA/CSA 101/I.S.2/A440, or ASTM E283.

b. 0.04 cfm/ft^2 for curtain wall and storefront glazing, tested at a pressure of at least 1.57 pounds per square foot (psf) in accordance with NFRC 400, AAMA/WDMA/CSA 101/I.S.2/A440, or ASTM E283.

c. 0.2 cfm/ft^2 for all other products when tested at a pressure of at least 1.57 pounds per square foot (psf) in accordance with NFRC 400 or AAMA/WDMA/CSA 101/I.S.2/A440, or 0.3 cfm/ft^2 when tested at a pressure of at least 6.24 pounds per square foot (psf) in accordance with AAMA/WDMA/CSA 101/I.S/A440.

EXCEPTIONS:
1. Openings that are required to be fire resistant.
2. Field-fabricated fenestration and doors that are weather-stripped or sealed in accordance with Section 1314.1.
3. For garage doors, air leakage determined by test at standard test conditions in accordance with ANSI/DASMA 105 shall be an acceptable alternate for compliance with air leakage requirements.
4. Units without air leakage ratings produced by small business that are weatherstripped or sealed in accordance with Section 1314.1.

1314.3 Building Assemblies Used as Ducts or Plenums: Building assemblies used as ducts or plenums shall be sealed, caulked, and gasketed to limit air leakage.

1314.4 Recessed Lighting Fixtures: When installed in the building envelope, recessed lighting fixtures shall be Type IC rated, and certified under ASTM E283 to have no more than 2.0 cfm air movement from the conditioned space to the ceiling cavity. The lighting fixture shall be tested at 75 Pascals or 1.57 lbs/ft^2 pressure difference and have a label attached, showing compliance with this test method. Recessed lighting fixtures shall be installed with a gasket or caulk between the fixture and ceiling to prevent air leakage.

1314.5 Loading Dock Weatherseals: Cargo doors and loading dock doors shall be equipped with weatherseals to restrict infiltration when vehicles are parked in the doorway.

1314.6 Continuous Air Barrier: For buildings over five stories, the building envelope shall be designed and constructed with a continuous air barrier to control air leakage into, or out of, the conditioned space. All air barrier components of each envelope assembly shall be clearly identified on construction documents and the joints, interconnections and penetrations of the air barrier components shall be detailed.

1314.6.1 Characteristics: The continuous air barrier shall have the following characteristics:

a. The air barrier component of each assembly shall be joined and sealed in a flexible manner to the air barrier com-

ponent of adjacent assemblies, allowing for the relative movement of these assemblies and components. This requirement shall not be construed to restrict the materials or methods by which the air barrier is achieved.

b. It shall be capable of withstanding positive and negative combined design wind, fan and stack pressures on the air barrier without damage or displacement, and shall transfer the load to the structure. It shall not displace adjacent materials under full load.

c. It shall be installed in accordance with the manufacturer's instructions and in such a manner as to achieve the performance requirements.

1314.6.2 Compliance: Compliance of the continuous air barrier for the opaque building envelope shall be demonstrated by testing the completed building and demonstrating that the air leakage rate of the building envelope does not exceed 0.40 cfm/ft^2 at a pressure differential of 0.3 inch w.g. (1.57 psf) as specified below.

a. Whole building testing shall be accomplished in accordance with ASTM E 779 or approved similar test. Tests shall be accomplished using either pressurization or depressurization or both. The building shall not be tested unless it is verified that the continuous air barrier is in place and installed without failures in accordance with installation instructions so that repairs to the continuous air barrier, if needed to comply with the required air leakage rate, can be done in a timely manner. Following are comments referring to ASTM E 779:

b. Under ASTM E 779 it is permissible to test using the building's HVAC system. In buildings with multistory HVAC systems and shafts it is permissible to test using the building's mechanical system using CAN/CGSB-149.15-96 Determination of the Overall Envelope Airtightness of Buildings by the Fan Pressurization Method Using the Building's Air Handling Systems, Canadian General Standards Board, Ottawa.

c. In lieu of the fan pressurization method described in ASTM E 779, a tracer gas test of the building air change rate in accordance with ASTM E 741 is also allowed. The tracer gas test shall be run with building HVAC fans off.

d. Section 8.1 - For purposes of this test, a multizone building shall be configured as a single zone by opening all interior doors, and otherwise connecting the interior spaces as much as possible. It is also allowed to test a smaller section of the building, provided the test area can be isolated from neighboring conditioned zones by balancing the pressure in adjacent conditioned zones to that in the zone being tested. This can be very difficult to do in buildings with multistory shafts and HVAC systems. If a smaller section of the building is tested, provide a drawing showing the zone(s) tested, the pressure boundaries and a diagram of the testing equipment configuration.

e. Section 8.2 - Seal all intentional functional openings such as exhaust and relief louvers, grilles and dryer vents that are not used in the test to introduce air, using plastic sheeting and duct tape or similar materials. All plumbing traps shall be filled with water.

f. Section 8.10 - The test pressure range shall be from 10 Pa to 80 Pa. If approved by the building official, lower test pressures are acceptable, but the upper limit shall not be less than 50 Pa.

g. Section 9.4 - If both pressurization and depressurization are not tested, plot the air leakage against the corrected ΔP for either pressurization or depressurization.

h. Section 9.6.4 - If the pressure exponent n is less than 0.5 or greater than 1, corrective work shall be performed to the continuous air barrier and the test shall be rerun.

i. Section 10.4 - Report the air leakage rate normalized in cfm/ft^2 at 0.3 inch w.g. (1.57 psf) over the total area of the building envelope air pressure boundary including the lowest floor, any below-grade walls, above-grade walls, and roof (or ceiling) (including windows and skylights) separating the interior conditioned space from the unconditioned environment.

1314.6.3 Certificate of Occupancy: A final certificate of occupancy shall not be issued for the building, or portion thereof, until such time that the building official determines the building, or portion thereof, has been field tested in accordance with Section 1314.6.2.

[Statutory Authority: RCW 19.27A.025, 19.27A.045. 10-03-115, 10-13-113 and 10-22-056, § 51-11-1314, filed 1/20/10, 6/21/10 and 10/28/10, effective 1/1/11. Statutory Authority: RCW 19.27A.022, 19.27A.025, 19.27A.045, and chapters 19.27 and 34.05 RCW. 07-01-089, § 51-11-1314, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27A.025. 93-21-052, § 51-11-1314, filed 10/18/93, effective 4/1/94.]

Reviser's note: Notice of Objection: The Joint Administrative Rules Review Committee (Committee) finds that, in adopting the 2009 proposed changes to the State Energy Code, Chapter 51-11 WAC, on November 20, 2009, the State Building Code Council (Council) failed to comply with all requirements of the law and failed to adequately respond to the Committee's request for additional economic impact and cost-benefit analyses prior to adoption.

On October 1, 2009, the Committee found that the Small Business Economic Impact Statement (SBEIS) for the proposed changes filed with the Code Reviser failed to comply with all requirements of law. The Committee requested that the Council conduct a cost-benefit analysis pursuant to RCW 34.05.328 and amend the SBEIS to provide additional economic impact information, including an estimate of the number of jobs that would be created or lost as a result of compliance with all the proposed rules, as required by RCW 19.85.040 (2)(d).

The Council provided the Committee with information and data on November 18, 2009. On December 2, 2009, the Committee found that the Council failed to adequately respond to the Committee's request for additional data. Specifically, the Committee found that the Council failed to amend the SBEIS to (a) estimate the number of jobs that would be created or lost as a result of compliance with the proposed changes; and (b) support the SBEIS with a detailed and rigorous costs analysis of the cumulative impact of all the changes. In addition, the Committee found that the Council failed to provide the Committee with a cost-benefit analysis of the proposed changes and pursuant to the requirements of RCW 34.05.328.

The Committee strongly supports a process that makes thoughtful and informed progress towards changes that result in improved energy efficiency in our buildings, wherever practicable. While the Council worked diligently, it is the opinion of the Committee that the Council did not fully develop and consider the economic impacts and costs versus benefits of these significant changes to our Energy Code. Furthermore, it is the opinion of the Committee that the Council and the Legislature need this information to fully evaluate the value, impacts, and consequences of the proposed codes, with due diligence to their respective fiduciary responsibilities, in order to create the best informed public policy.

As a result, the Committee recommends that the Governor suspend the adoption and implementation of the changes to the Energy Code, Chapter 51-11 WAC, adopted by the Council on November 20, 2009, until such time as a more adequate analysis has been completed and considered by the appropriate bodies.

For all of the above stated reasons, the Committee objects to the changes to the State Energy Code, Chapter 51-11 WAC, that were adopted by the Council on November 20, 2009, and hereby directs the Code Reviser, pursuant to RCW 34.05.640(4), to publish this Notice of Objection in the Washington State Register and along with any publication in the Washington

Administrative Code of changes to Chapter 51-11 WAC that were adopted by the Council in 2009 and filed with the Code Reviser.

WAC 51-11-1322 Opaque envelope. Roof/ceilings, opaque exterior walls, opaque doors, floors over unconditioned space, below grade walls, slab on grade floors, and radiant floors enclosing conditioned spaces shall be insulated according to Section 1311 and Tables 13-1 or 13-2. Compliance with nominal R-values shall be demonstrated for the thermal resistance of the added insulation in framing cavities and/or insulated sheathing only. Nominal R-values shall not include the thermal transmittance of other building materials or air films.

For metal frame assemblies used in spaces with electric resistance space heat, compliance shall be demonstrated with the component U-factor for the overall assembly based on the assemblies in Chapter 10.

Area-weighted averaging of the R-value is not allowed. When showing compliance with R-values, the minimum insulation R-value for all areas of the component shall comply with Table 13-1 or 13-2. When calculating compliance using U-factors, area-weighted averaging is allowed. Where insulation is tapered (e.g., roofs), separate assembly U-factors shall be calculated for each four-foot section of tapered insulation.

EXCEPTION: Opaque smoke vents are not required to meet insulation requirements.

[Statutory Authority: RCW 19.27A.025, 19.27A.045. 10-03-115, 10-13-113 and 10-22-056, § 51-11-1322, filed 1/20/10, 6/21/10 and 10/28/10, effective 1/1/11. Statutory Authority: RCW 19.27A.025, 19.27A.045 and chapters 19.27, 19.27A, and 34.05 RCW. 05-01-013, § 51-11-1322, filed 12/2/04, effective 7/1/05. Statutory Authority: RCW 19.27A.025, 19.27A.045. 01-03-010, § 51-11-1322, filed 1/5/01, effective 7/1/01. Statutory Authority: RCW 19.27A.025. 93-21-052, § 51-11-1322, filed 10/18/93, effective 4/1/94.]

Reviser's note: : The Joint Administrative Rules Review Committee (Committee) finds that, in adopting the 2009 proposed changes to the State Energy Code, Chapter 51-11 WAC, on November 20, 2009, the State Building Code Council (Council) failed to comply with all requirements of the law and failed to adequately respond to the Committee's request for additional economic impact and cost-benefit analyses prior to adoption.

On October 1, 2009, the Committee found that the Small Business Economic Impact Statement (SBEIS) for the proposed changes filed with the Code Reviser failed to comply with all requirements of law. The Committee requested that the Council conduct a cost-benefit analysis pursuant to RCW 34.05.328 and amend the SBEIS to provide additional economic impact information, including an estimate of the number of jobs that would be created or lost as a result of compliance with all the proposed rules, as required by RCW 19.85.040 (2)(d).

The Council provided the Committee with information and data on November 18, 2009. On December 2, 2009, the Committee found that the Council failed to adequately respond to the Committee's request for additional data. Specifically, the Committee found that the Council failed to amend the SBEIS to (a) estimate the number of jobs that would be created or lost as a result of compliance with the proposed changes; and (b) support the SBEIS with a detailed and rigorous costs analysis of the cumulative impact of all the changes. In addition, the Committee found that the Council failed to provide the Committee with a cost-benefit analysis of the proposed changes and pursuant to the requirements of RCW 34.05.328.

The Committee strongly supports a process that makes thoughtful and informed progress towards changes that result in improved energy efficiency in our buildings, wherever practicable. While the Council worked diligently, it is the opinion of the Committee that the Council did not fully develop and consider the economic impacts and costs versus benefits of these significant changes to our Energy Code. Furthermore, it is the opinion of the Committee that the Council and the Legislature need this information to fully evaluate the value, impacts, and consequences of the proposed codes, with due diligence to their respective fiduciary responsibilities, in order to create the best informed public policy.

As a result, the Committee recommends that the Governor suspend the adoption and implementation of the changes to the Energy Code, Chapter 51-11 WAC, adopted by the Council on November 20, 2009, until such time as a more adequate analysis has been completed and considered by the appropriate bodies.

For all of the above stated reasons, the Committee objects to the changes to the State Energy Code, Chapter 51-11 WAC, that were adopted by the Council on November 20, 2009, and hereby directs the Code Reviser, pursuant to RCW 34.05.640(4), to publish this Notice of Objection in the Washington State Register and along with any publication in the Washington Administrative Code of changes to Chapter 51-11 WAC that were adopted by the Council in 2009 and filed with the Code Reviser.

WAC 51-11-1323 Glazing. Glazing shall comply with Section 1312 and Tables 13-1 or 13-2. All glazing shall be, at a minimum, double glazing. In addition, all glazing assemblies shall have at least one low-emissivity coating unless the glazing assembly has an overall U-factor that complies with the values in Table 13-1 or 13-2.

EXCEPTIONS:

1. Vertical glazing located on the display side of the street level story of a retail occupancy provided the glazing:
   a.(i) Is double-glazed with a minimum 1/2 inch airspace and with a low-e coating having a maximum emittance of e-0.10 in a nonmetal frame or a metal frame having a thermal break (as defined in footnote 2 to Table 10-6B); or
   (ii) Has an area weighted U-factor of 0.50 or less. (U-factor calculations shall use overall assembly U-factors. When this exception is used, there are no SHGC requirements); and
   b. Does not exceed 75 percent of the gross exterior wall area of the display side of the street level story, measured from the top of the finished floor at street level. However, if the display side of the street level story exceeds 20 feet in height, then this exception may only be used for the first 20 feet of that story.
   When this exception is utilized, separate calculations shall be performed for these sections of the building envelope and these values shall not be averaged with any others for compliance purposes. The 75 percent area may be exceeded on the street level, if the additional glass area is provided from allowances from other areas of the building.
2. Single glazing for security purposes and vestibules and revolving doors shall be included in the percentage of the total glazing area, U-factor calculation and SHGC as allowed in the Tables 13-1 or 13-2. The maximum area allowed for the total of all single glazing is one percent of the gross exterior wall area.

1323.1 Area: The percentage of total glazing (vertical and overhead) area relative to the gross exterior wall area shall not be greater than the appropriate value from Tables 13-1 or 13-2 for the vertical glazing U-factor, overhead glazing U-factor and solar heat gain coefficient selected.

1323.2 U-Factor: The area-weighted average U-factor of vertical glazing shall not be greater than that specified in Tables 13-1 or 13-2 for the appropriate area and solar heat gain coefficient. The area-weighted average U-factor of overhead glazing shall not be greater than that specified in Tables 13-1 or 13-2 for the appropriate area and solar heat gain coefficient. U-factors for glazing shall be determined in accordance with Section 1312.

1323.3 Solar Heat Gain Coefficient: The area-weighted average solar heat gain coefficient of all glazing shall not be greater than that specified in Tables 13-1 or 13-2 for the appropriate area and U-factor.

EXCEPTIONS:

1. Glazing separating conditioned space from semi-heated space or unconditioned space.

2. Vertical glazing which is oriented within 45 degrees of north shall be allowed to have a maximum solar heat gain coefficient SHGC-0.05 above that required in Tables 13-1 and 13-2. When this exception is utilized, separate calculations shall be performed for these sections of the building envelope and these values shall not be averaged with any others for compliance purposes.

3. For demonstrating compliance for vertical glazing for the first SHGC option in Tables 13-1 and 13-2 only, the SHGC in the proposed building shall be allowed to be reduced by using the multipliers in the table below for each glazing product shaded by permanent projections that will last as long as the building itself.

Projection Factor	SHGC Multiplier (All Orientations Except North-Oriented)	SHGC Multiplier (North-Oriented)
0 - 0.10	1.00	1.00
<0.10 - 0.20	0.91	0.95
<0.20 - 0.30	0.82	0.91
<0.30 - 0.40	0.74	0.87
<0.40 - 0.50	0.67	0.84
<0.50 - 0.60	0.61	0.81
<0.60 - 0.70	0.56	0.78
<0.70 - 0.80	0.51	0.76
<0.80 - 0.90	0.47	0.75
<0.90 - 1.00	0.44	0.73

Projection factor (PF) is the ratio of the horizontal depth of the external shading projection (A) divided by the sum of the height of the fenestration and the distance from the top of the fenestration to the bottom of the farthest point of the external shading projection (B), in consistent units. (See Figure 13B.)

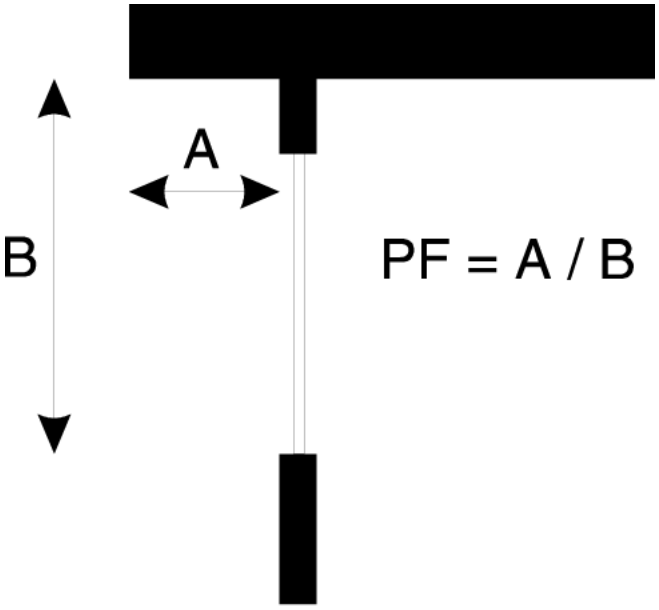

FIGURE 13B

[Statutory Authority: RCW 19.27A.025, 19.27A.045. 10-03-115, 10-13-113 and 10-22-056, § 51-11-1323, filed 1/20/10, 6/21/10 and 10/28/10, effective 1/1/11; 01-03-010, § 51-11-1323, filed 1/5/01, effective 7/1/01; 98-03-003, § 51-11-1323, filed 1/8/98, effective 7/1/98. Statutory Authority: RCW 19.27A.025. 93-21-052, § 51-11-1323, filed 10/18/93, effective 4/1/94.]

Reviser's note: Notice of Objection: The Joint Administrative Rules Review Committee (Committee) finds that, in adopting the 2009 proposed changes to the State Energy Code, Chapter 51-11 WAC, on November 20, 2009, the State Building Code Council (Council) failed to comply with all requirements of the law and failed to adequately respond to the Committee's request for additional economic impact and cost-benefit analyses prior to adoption.

On October 1, 2009, the Committee found that the Small Business Economic Impact Statement (SBEIS) for the proposed changes filed with the Code Reviser failed to comply with all requirements of law. The Committee requested that the Council conduct a cost-benefit analysis pursuant to RCW 34.05.328 and amend the SBEIS to provide additional economic impact information, including an estimate of the number of jobs that would be created or lost as a result of compliance with all the proposed rules, as required by RCW 19.85.040 (2)(d).

The Council provided the Committee with information and data on November 18, 2009. On December 2, 2009, the Committee found that the Council failed to adequately respond to the Committee's request for additional data. Specifically, the Committee found that the Council failed to amend the SBEIS to (a) estimate the number of jobs that would be created or lost as a result of compliance with the proposed changes; and (b) support the SBEIS with a detailed and rigorous costs analysis of the cumulative impact of all the changes. In addition, the Committee found that the Council failed to provide the Committee with a cost-benefit analysis of the proposed changes and pursuant to the requirements of RCW 34.05.328.

The Committee strongly supports a process that makes thoughtful and informed progress towards changes that result in improved energy efficiency in our buildings, wherever practicable. While the Council worked diligently, it is the opinion of the Committee that the Council did not fully develop and consider the economic impacts and costs versus benefits of these significant changes to our Energy Code. Furthermore, it is the opinion of the Committee that the Council and the Legislature need this information to fully evaluate the value, impacts, and consequences of the proposed codes, with due diligence to their respective fiduciary responsibilities, in order to create the best informed public policy.

As a result, the Committee recommends that the Governor suspend the adoption and implementation of the changes to the Energy Code, Chapter 51-11 WAC, adopted by the Council on November 20, 2009, until such time as a more adequate analysis has been completed and considered by the appropriate bodies.

For all of the above stated reasons, the Committee objects to the changes to the State Energy Code, Chapter 51-11 WAC, that were adopted by the Council on November 20, 2009, and hereby directs the Code Reviser, pursuant to RCW 34.05.640(4), to publish this Notice of Objection in the Washington State Register and along with any publication in the Washington Administrative Code of changes to Chapter 51-11 WAC that were adopted by the Council in 2009 and filed with the Code Reviser.

WAC 51-11-1331 General. Buildings or structures whose design heat loss rate (UA_p) and solar heat gain coefficient rate ($SHGC*A_p$) are less than or equal to the target heat loss rate (UA_t) and solar heat gain coefficient rate ($SHGC*A_t$) shall be considered in compliance with this section. The stated U-factor, F-factor or allowable area of any component assembly, listed in Tables 13-1 or 13-2, such as roof/ceiling, opaque wall, opaque door, glazing, floor over conditioned space, slab on grade floor, radiant floor or opaque floor may be increased and the U-factor or F-factor for other components decreased, provided that the total heat gain or loss for the entire building envelope does not exceed the total resulting from compliance to the U-factors, F-factors or allowable areas specified in this section.

EXCEPTION: Compliance is also allowed to be shown using RS-32 for Climate Zone 1 except for buildings containing attic roofs, wood framed walls or vertical fenestration with nonmetal frames, or for Group R occupancies.

[Statutory Authority: RCW 19.27A.025, 19.27A.045. 10-03-115, 10-13-113 and 10-22-056, § 51-11-1331, filed 1/20/10, 6/21/10 and 10/28/10, effective 1/1/11. Statutory Authority: RCW 19.27A.022, 19.27A.025, 19.27A.045, and chapters 19.27 and 34.05 RCW. 07-01-089, § 51-11-1331, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27A.025, 19.27A.045 and chapters 19.27, 19.27A, and 34.05 RCW. 05-01-013, § 51-11-1331, filed 12/2/04, effective 7/1/05. Statutory Authority: RCW 19.27A.025, 19.27A.045. 01-03-010, § 51-11-1331, filed 1/5/01, effective 7/1/01; 98-03-003, § 51-11-1331, filed 1/8/98, effective 7/1/98. Statutory Authority: RCW 19.27A.025. 93-21-052, § 51-11-1331, filed 10/18/93, effective 4/1/94.]

Reviser's note: Notice of Objection: The Joint Administrative Rules Review Committee (Committee) finds that, in adopting the 2009 proposed changes to the State Energy Code, Chapter 51-11 WAC, on November 20, 2009, the State Building Code Council (Council) failed to comply with all requirements of the law and failed to adequately respond to the Committee's request for additional economic impact and cost-benefit analyses prior to adoption.

On October 1, 2009, the Committee found that the Small Business Economic Impact Statement (SBEIS) for the proposed changes filed with the Code Reviser failed to comply with all requirements of law. The Committee requested that the Council conduct a cost-benefit analysis pursuant to RCW 34.05.328 and amend the SBEIS to provide additional economic impact information, including an estimate of the number of jobs that would be created or lost as a result of compliance with all the proposed rules, as required by RCW 19.85.040 (2)(d).

The Council provided the Committee with information and data on November 18, 2009. On December 2, 2009, the Committee found that the Council failed to adequately respond to the Committee's request for additional data. Specifically, the Committee found that the Council failed to amend the SBEIS to (a) estimate the number of jobs that would be created or lost as a result of compliance with the proposed changes; and (b) support the SBEIS with a detailed and rigorous costs analysis of the cumulative impact of all the changes. In addition, the Committee found that the Council failed to provide the Committee with a cost-benefit analysis of the proposed changes and pursuant to the requirements of RCW 34.05.328.

The Committee strongly supports a process that makes thoughtful and informed progress towards changes that result in improved energy efficiency in our buildings, wherever practicable. While the Council worked diligently, it is the opinion of the Committee that the Council did not fully develop and consider the economic impacts and costs versus benefits of these significant changes to our Energy Code. Furthermore, it is the opinion of the Committee that the Council and the Legislature need this information to fully evaluate the value, impacts, and consequences of the proposed codes, with due diligence to their respective fiduciary responsibilities, in order to create the best informed public policy.

As a result, the Committee recommends that the Governor suspend the adoption and implementation of the changes to the Energy Code, Chapter 51-11 WAC, adopted by the Council on November 20, 2009, until such time as a more adequate analysis has been completed and considered by the appropriate bodies.

For all of the above stated reasons, the Committee objects to the changes to the State Energy Code, Chapter 51-11 WAC, that were adopted by the Council on November 20, 2009, and hereby directs the Code Reviser, pursuant to RCW 34.05.640(4), to publish this Notice of Objection in the Washington State Register and along with any publication in the Washington Administrative Code of changes to Chapter 51-11 WAC that were adopted by the Council in 2009 and filed with the Code Reviser.

WAC 51-11-1332 Component U-factors. The U-factors for typical construction assemblies are included in Chapter 10. These values shall be used for all calculations. Where proposed construction assemblies are not represented in Chapter 10, values shall be calculated in accordance with Chapters 16 through 18 and 25 through 27 in Standard RS-1 listed in Chapter 7, using the framing factors listed in Chapter 10. For envelope assemblies containing metal framing, the U-factor shall be determined by one of the following methods:

1. Results of laboratory measurements according to acceptable methods of test.
2. Standard RS-1, listed in Chapter 7, where the metal framing is bonded on one or both sides to a metal skin or covering.
3. The zone method as provided in Chapter 27 of Standard RS-1, listed in Chapter 7.
4. Effective framing/cavity R-values as provided in Table 10-5A.

When return air ceiling plenums are employed, the roof/ceiling assembly shall:

a. For thermal transmittance purposes, not include the ceiling proper nor the plenum space as part of the assembly; and
b. For gross area purposes, be based upon the interior face of the upper plenum surface.

[Statutory Authority: RCW 19.27A.025, 19.27A.045. 10-03-115, 10-13-113 and 10-22-056, § 51-11-1332, filed 1/20/10, 6/21/10 and 10/28/10, effective 1/1/11. Statutory Authority: RCW 19.27A.020, 19.27A.045. 04-01-106, § 51-11-1332, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27A.025. 93-21-052, § 51-11-1332, filed 10/18/93, effective 4/1/94.]

Reviser's note: Notice of Objection: The Joint Administrative Rules Review Committee (Committee) finds that, in adopting the 2009 proposed changes to the State Energy Code, Chapter 51-11 WAC, on November 20, 2009, the State Building Code Council (Council) failed to comply with all requirements of the law and failed to adequately respond to the Committee's request for additional economic impact and cost-benefit analyses prior to adoption.

On October 1, 2009, the Committee found that the Small Business Economic Impact Statement (SBEIS) for the proposed changes filed with the Code Reviser failed to comply with all requirements of law. The Committee requested that the Council conduct a cost-benefit analysis pursuant to RCW 34.05.328 and amend the SBEIS to provide additional economic impact information, including an estimate of the number of jobs that would be created or lost as a result of compliance with all the proposed rules, as required by RCW 19.85.040 (2)(d).

The Council provided the Committee with information and data on November 18, 2009. On December 2, 2009, the Committee found that the Council failed to adequately respond to the Committee's request for additional data. Specifically, the Committee found that the Council failed to amend the SBEIS to (a) estimate the number of jobs that would be created or lost as a result of compliance with the proposed changes; and (b) support the SBEIS with a detailed and rigorous costs analysis of the cumulative impact of all the changes. In addition, the Committee found that the Council failed to provide the Committee with a cost-benefit analysis of the proposed changes and pursuant to the requirements of RCW 34.05.328.

The Committee strongly supports a process that makes thoughtful and informed progress towards changes that result in improved energy efficiency in our buildings, wherever practicable. While the Council worked diligently, it is the opinion of the Committee that the Council did not fully develop and consider the economic impacts and costs versus benefits of these significant changes to our Energy Code. Furthermore, it is the opinion of the Committee that the Council and the Legislature need this information to fully evaluate the value, impacts, and consequences of the proposed codes, with due diligence to their respective fiduciary responsibilities, in order to create the best informed public policy.

As a result, the Committee recommends that the Governor suspend the adoption and implementation of the changes to the Energy Code, Chapter 51-11 WAC, adopted by the Council on November 20, 2009, until such time as a more adequate analysis has been completed and considered by the appropriate bodies.

For all of the above stated reasons, the Committee objects to the changes to the State Energy Code, Chapter 51-11 WAC, that were adopted by the Council on November 20, 2009, and hereby directs the Code Reviser, pursuant to RCW 34.05.640(4), to publish this Notice of Objection in the Washington State Register and along with any publication in the Washington Administrative Code of changes to Chapter 51-11 WAC that were adopted by the Council in 2009 and filed with the Code Reviser.

WAC 51-11-1334 Solar heat gain coefficient rate calculations. Solar heat gain coefficient shall comply with Section 1323.3. The target $SHGCA_t$ and the proposed $SHGCA_p$ shall be calculated using Equation 13-3 and 13-4 and the corresponding areas and SHGCs from Table 13-1 or 13-2.

Equation 13-1:
Target UA_t

$UA_t = U_{radt}A_{radt} + U_{mrt}A_{mrt} + U_{rst}A_{rst} + U_{ort}A_{ort} + U_{ogcort}A_{ogcort} + U_{ogort}A_{ogort} + U_{mwt}A_{mwt} + U_{mbwt}A_{mbwt} + U_{sfwt}A_{sfwt} + U_{wt}A_{wt} + U_{vgt}A_{vgt} + U_{vgmt}A_{vgmt} + U_{vgdt}A_{vgdt} + U_{dt}A_{dt} + U_{fmt}A_{fmt} + U_{fst}A_{fst} + U_{ft}A_{ft} + F_{st}P_{st} + F_{rst}P_{rst}$

UA_t	=	The target combined specific heat transfer of the gross roof/ceiling assembly, exterior wall and floor area.
Where:		
U_{radt}	=	The thermal transmittance value for roofs with the insulation entirely above deck found in Table 13-1 or 13-2.
U_{mrt}	=	The thermal transmittance value for metal building roofs found in Table 13-1 or 13-2.
U_{rst}	=	The thermal transmittance value for single rafter roofs found in Table 13-1 or 13-2.
U_{ort}	=	The thermal transmittance value for attic and other roofs found in Table 13-1 or 13-2.
U_{ogcort}	=	The thermal transmittance for overhead glazing with curb found in Table 13-1 or 13-2 which corresponds to the proposed total glazing area as a percent of gross exterior wall area.
U_{ogort}	=	The thermal transmittance for overhead glazing without curb found in Table 13-1 or 13-2 which corresponds to the proposed total glazing area as a percent of gross exterior wall area.
U_{mwt}	=	The thermal transmittance value for opaque mass walls found in Table 13-1 or 13-2.
U_{mbwt}	=	The thermal transmittance value for opaque metal building walls found in Table 13-1 or 13-2.
U_{sfwt}	=	The thermal transmittance value for opaque steel framed walls found in Table 13-1 or 13-2.
U_{wt}	=	The thermal transmittance value for opaque wood framed and other walls found in Table 13-1 or 13-2.
U_{vgt}	=	The thermal transmittance value for vertical glazing with nonmetal framing found in Table 13-1 or 13-2 which corresponds to the proposed total glazing area as a percent of gross exterior wall area.
U_{vgmt}	=	The thermal transmittance value for vertical glazing with metal framing found in Table 13-1 or 13-2 which corresponds to the proposed total glazing area as a percent of gross exterior wall area.
U_{vgdt}	=	The thermal transmittance value for entrance doors found in Table 13-1 or 13-2 which corresponds to the proposed total glazing area as a percent of gross exterior wall area.
U_{dt}	=	The thermal transmittance value for opaque doors found in Table 13-1 or 13-2.
U_{fmt}	=	The thermal transmittance value for mass floors over unconditioned space found in Table 13-1 or 13-2.
U_{fst}	=	The thermal transmittance value for steel joist floors over unconditioned space found in Table 13-1 or 13-2.
U_{ft}	=	The thermal transmittance value for wood framed or other floors over unconditioned space found in Table 13-1 or 13-2.
F_{st}	=	The F-factor for slab-on-grade floors found in Table 13-1 or 13-2.
F_{rst}	=	The F-factor for radiant slab floors found in Table 13-1 or 13-2.
A_{dt}	=	The proposed opaque door area, A_d.
A_{fmt}	=	The proposed mass floor over unconditioned space area, A_{fm}.
A_{fst}	=	The proposed steel joist floor over unconditioned space area, A_{fs}.
A_{ft}	=	The proposed wood framed and other floor over unconditioned space area, A_f.
P_{st}	=	The proposed linear feet of slab-on-grade floor perimeter, P_s.
P_{rst}	=	The proposed linear feet of radiant slab floor perimeter, P_{rs}.

and;

if the total amount of glazing area as a percent of gross exterior wall area does not exceed the maximum allowed in Table 13-1 or 13-2:

A_{radt}	=	The proposed roof area with insulation entirely above deck, A_{rad}.
A_{mrt}	=	The proposed roof area for metal building, A_{mr}.
A_{rst}	=	The proposed single rafter roof area, A_{ors}.
A_{ort}	=	The proposed attic and other roof area, A_{or}.
A_{ogcort}	=	The proposed overhead glazing area with curbs, A_{ogcor}.
A_{ogort}	=	The proposed overhead glazing area without curbs, A_{ogor}.
A_{mwt}	=	The proposed opaque mass wall area, A_{mw}.
A_{mbwt}	=	The proposed opaque metal building wall area, A_{mbw}.
A_{sfwt}	=	The proposed opaque steel framed wall area, A_{sfw}.
A_{wt}	=	The proposed opaque wood framed and other wall area, A_w.
A_{vgt}	=	The proposed vertical glazing area with nonmetal framing, A_{vg}.
A_{vgmt}	=	The proposed vertical glazing area with metal framing, A_{vgm}.
A_{vgdt}	=	The proposed entrance door area, A_{vgd}.

or;

if the total amount of glazing area as a percent of gross exterior wall area exceeds the maximum allowed in Table 13-1 or 13-2, the area of each fenestration element shall be reduced in the base envelope design by the same percentage and the net area of each wall type adjusted proportionately by the same percentage so that the total overhead and vertical fenestration area is exactly equal to 40% of the gross wall area.

EQUATION 13-2
Proposed UA_p

$$UA_p = U_{mr}A_{mr} + U_{ad}A_{ad} + U_{rs}A_{rs} + U_{ra}A_{ra} + U_{ogc}A_{ogc} + U_{og}A_{og} + U_{mw}A_{mw} + U_{mbw}A_{mbw} + U_{sfw}A_{sfw} + U_{wfow}A_{wfow} + U_dA_d + U_{vg}A_{vg} + U_{vgm}A_{vgm} + U_{vgd}A_{vgd} + U_{fm}A_{fm} + U_{fs}A_{fs} + U_{fwo}A_{fwo} + F_sP_s + F_{sr}P_{sr}$$

Where:

UA_p	=	The combined proposed specific heat transfer of the gross exterior wall, floor and roof/ceiling assembly area.
U_{mr}	=	The thermal transmittance of the metal building roof area.
A_{mr}	=	Opaque metal building roof area.
U_{rad}	=	The thermal transmittance of the roof area where the insulation is entirely above roof deck.
A_{rad}	=	Opaque roof area where the insulation is entirely above roof deck.
U_{rs}	=	The thermal transmittance of the single rafter roof area.
A_{rs}	=	Opaque single rafter roof area.
U_{ra}	=	The thermal transmittance of the roof over attic and other roof area.
A_{ra}	=	Opaque roof over attic and other roof area.
U_{ogc}	=	The thermal transmittance for the overhead glazing with curbs.
A_{ogc}	=	Overhead glazing area with curbs.
U_{og}	=	The thermal transmittance for the overhead glazing without curbs.
A_{og}	=	Overhead glazing area without curbs.
U_{mw}	=	The thermal transmittance of the opaque mass wall area.
A_{mw}	=	Opaque mass wall area (not including opaque doors).
U_{mbw}	=	The thermal transmittance of the opaque metal building wall area.
A_{mbw}	=	Opaque metal building wall area (not including opaque doors).
U_{sfw}	=	The thermal transmittance of the opaque steel framed wall area.
A_{sfw}	=	Opaque steel framed wall area (not including opaque doors).
U_{wfow}	=	The thermal transmittance of the opaque wood framed and other wall area.
A_{wfow}	=	Opaque wood framed and other wall area (not including opaque doors).
U_{vg}	=	The thermal transmittance of the vertical glazing area with nonmetal framing.
A_{vg}	=	Vertical glazing area with nonmetal glazing.
U_{vgmf}	=	The thermal transmittance of the vertical glazing area with metal framing.
A_{vgmf}	=	Vertical glazing area with metal framing.
U_{vgd}	=	The thermal transmittance of the vertical glazing area for entrance doors.
A_{vgd}	=	Vertical glazing area for entrance doors.
U_d	=	The thermal transmittance value of the opaque door area.
A_d	=	Opaque door area.
U_{fm}	=	The thermal transmittance of the mass floor over unconditioned space area.
A_{fm}	=	Mass floor area over unconditioned space.
U_{fs}	=	The thermal transmittance of the steel joist floor over unconditioned space area.
A_{fs}	=	Steel joist floor area over unconditioned space.
U_{fwo}	=	The thermal transmittance of the wood framed and other floor over unconditioned space area.
A_{fwo}	=	Wood framed and other floor area over unconditioned space.
F_s	=	Slab-on-grade floor component F-factor.
P_s	=	Linear feet of slab-on-grade floor perimeter.
F_{sr}	=	Radiant floor component F-factor.
P_{sr}	=	Lineal feet of radiant floor perimeter.

NOTE: Where more than one type of wall, window, roof/ceiling, door and skylight is used, the U and A terms for those items shall be expanded into sub-elements as:

$$U_{mw1}A_{mw1} + U_{mw2}A_{mw2} + U_{sfw1}A_{sfw1} + \text{...etc.}$$

EQUATION 13-3
Target $SHGCA_t$

$SHGCA_t = SHGC_t (A_{ogcort} + A_{ogort} + A_{vgt} + A_{vgmt} + A_{vgot})$

Where:

$SHGCA_t$ = The target combined specific heat gain of the target glazing area.

$SHGC_t$ = The solar heat gain coefficient for glazing found in Table 13-1 or 13-2 which corresponds to the proposed total glazing area as a percent of gross exterior wall area, and A_{ogcort}, A_{ogort}, A_{vgmt}, A_{vgot} and A_{vgt} are defined under Equation 13-1.

EQUATION 13-4
Proposed $SHGCA_p$

$SHGCA_p = SHGC_{og}A_{og} + SHGC_{vg}A_{vg}$

Where:

$SHGCA_t$ = The combined proposed specific heat gain of the proposed glazing area.

$SHGC_{og}$ = The solar heat gain coefficient of the overhead glazing.

A_{og} = The overhead glazing area.

$SHGC_{vg}$ = The solar heat gain coefficient of the vertical glazing.

A_{vg} = The vertical glazing area.

TABLE 13-1
BUILDING ENVELOPE REQUIREMENTS FOR CLIMATE ZONE 1

	Nonresidential		Residential, Other than Single-Family	
Opaque Elements	**Assembly Max. U-factor**	**Insulation Min. R-Value**	**Assembly Max. U-factor**	**Insulation Min. R-Value**
Roofs				
Insulation entirely above deck	U-0.034	R-30 c.i.	U-0.031	R-38 c.i.
Metal building	U-0.031	R-25 + R-11 Ls	U-0.031	R-25 + R-11 Ls
Single-rafter	U-0.027	R-38	U-0.027	R-38
Attic and other	U-0.027	R-38 adv or R-49	U-0.027	R-38 adv or R-49
Walls, Above Grade				
Mass[1]	U-0.150	R-5.7 c.i.	U-0.090	R-11.4 c.i.
Metal building	U-0.064	R-13 + R-7.5 c.i.	U-0.057	R-19 + R-8.5 c.i.
Steel framed	U-0.064	R-13 + R-7.5 c.i.	U-0.057	R-19 + R-8.5 c.i.
Wood framed and other	U-0.057	R-21	U-0.057	R-13 + R-6 c.i.
Walls, Below Grade				
Below grade wall		Same as above grade		Same as above grade
Floors				
Mass	U-0.029	R-30 c.i.	U-0.029	R-30 c.i.
Steel joist	U-0.029	R-38 + R-4 c.i.	U-0.029	R-38 + R-4 c.i.
Wood framed and other	U-0.029	R-30	U-0.029	R-30
Slab-on-Grade Floors				
Unheated	F-0.540	R-10 for 24 in. (with thermal break)	F-0.540	R-10 for 24 in. (with thermal break)
Heated	F-0.360	R-10 c.i. (with thermal break)	F-0.360	R-10 c.i. (with thermal break)
Opaque Doors				
Swinging	U-0.600		U-0.400	
Nonswinging	U-0.600		U-0.400	

Fenestration 0-40% of Wall	**Assembly Max. U-Factor**	**Assembly Max. SHGC**	**Assembly Max. U-Factor**	**Assembly Max. SHGC**
Vertical Fenestration				
Nonmetal framing: All	U-0.32	SHGC-0.40 all OR	U-0.32	
Metal framing: Fixed/operable	U-0.40	SHGC-0.45 all PLUS Permanent PF>0.50 on	U-0.40	
Entrance doors	U-0.60	west, south and east	U-0.60	
Skylights				
Without curb (i.e., sloped glazing)	U-0.50	SHGC-0.35 all	U-0.50	SHGC-0.35 all
With curb (i.e., individual unit skylights)	U-0.60		U-0.60	

c.i. = continuous insulation, Ls = liner system (see definitions).

Footnote
1. Nonresidential walls may be ASTM C90 concrete block walls, ungrouted or partially grouted at 32 inches or less on center vertically and 48 inches or less on center horizontally, with ungrouted cores filled with material having a maximum thermal conductivity of 0.44 Btu·in/h·ft^2·°F.

TABLE 13-2
BUILDING ENVELOPE REQUIREMENTS
FOR CLIMATE ZONE 2

	Nonresidential		Residential, Other than Single-Family	
Opaque Elements	**Assembly Max. U-factor**	**Insulation Min. R-Value**	**Assembly Max. U-factor**	**Insulation Min. R-Value**
Roofs				
Insulation entirely above deck	U-0.034	R-30 c.i.	U-0.031	R-38 c.i.
Metal building	U-0.031	R-25 + R-11 Ls	U-0.031	R-25 + R-11 Ls
Single-rafter	U-0.027	R-38	U-0.027	R-38
Attic and other	U-0.027	R-38 adv or R-49	U-0.027	R-38 adv or R-49
Walls, Above Grade				
Mass	U-0.123	R-7.6 c.i.	U-0.080	R-13.3 c.i.
Metal building	U-0.064	R-13 + R-7.5 c.i.	U-0.044	R-19 + R-16 c.i.
Steel framed	U-0.064	R-13 + R-7.5 c.i.	U-0.044	R-19 + R-14 c.i.
Wood framed and other	U-0.051	R-13 + R-7.5 c.i. OR R-21 + R-2.5 c.i.	U-0.044	R-21+ R-5 c.i.
Walls, Below Grade				
Below grade wall		Same as above grade		Same as above grade
Floors				
Mass	U-0.029	R-30 c.i.	U-0.029	R-30 c.i.
Steel joist	U-0.029	R-38 + R-4 c.i.	U-0.029	R-38 + R-4 c.i.
Wood framed and other	U-0.029	R-30	U-0.029	R-30
Slab-on-Grade Floors				
Unheated	F-0.540	R-10 for 24 in. (with thermal break)	F-0.540	R-10 for 24 in. (with thermal break)
Heated	F-0.360	R-10 c.i. (with thermal break)	F-0.360	R-10 c.i. (with thermal break)
Opaque Doors				
Swinging	U-0.600		U-0.400	
Nonswinging	U-0.600		U-0.400	

Fenestration 0-40% of Wall	**Assembly Max. U-Factor**	**Assembly Max. SHGC**	**Assembly Max. U-Factor**	**Assembly Max. SHGC**
Vertical Fenestration				
Nonmetal framing: All	U-0.32	SHGC-0.40 all OR	U-0.32	
Metal framing: Fixed/operable	U-0.40	SHGC-0.45 all PLUS Permanent PF>0.50 on	U-0.40	
Entrance doors	U-0.60	west, south and east	U-0.60	
Skylights				
Without curb (i.e., sloped glazing)	U-0.50	SHGC-0.35 all	U-0.50	SHGC-0.35 all
With curb (i.e., individual unit skylights)	U-0.60		U-0.60	

c.i. = continuous insulation, Ls = liner system (see definitions).

[Statutory Authority: RCW 19.27A.025, 19.27A.045. 10-22-057, § 51-11-1334, filed 10/28/10, effective 1/1/11; 10-03-115, 10-13-113 and 10-22-056, § 51-11-1334, filed 1/20/10, 6/21/10 and 10/28/10, effective 1/1/11. Statutory Authority: RCW 19.27A.022, 19.27A.025, 19.27A.045, and chapters 19.27 and 34.05 RCW. 07-01-089, § 51-11-1334, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27A.025, 19.27A.045 and chapters 19.27, 19.27A, and 34.05 RCW. 05-01-013, § 51-11-1334, filed 12/2/04, effective 7/1/05. Statutory Authority: RCW 19.27A.025, 19.27A.045. 01-03-010, § 51-11-1334, filed 1/5/01, effective 7/1/01; 98-03-003, § 51-11-1334, filed 1/8/98, effective 7/1/98. Statutory Authority: RCW 19.27A.025. 93-21-052, § 51-11-1334, filed 10/18/93, effective 4/1/94.]

Reviser's note: Notice of Objection: The Joint Administrative Rules Review Committee (Committee) finds that, in adopting the 2009 proposed changes to the State Energy Code, Chapter 51-11 WAC, on November 20, 2009, the State Building Code Council (Council) failed to comply with all requirements of the law and failed to adequately respond to the Committee's request for additional economic impact and cost-benefit analyses prior to adoption.

On October 1, 2009, the Committee found that the Small Business Economic Impact Statement (SBEIS) for the proposed changes filed with the Code Reviser failed to comply with all requirements of law. The Committee requested that the Council conduct a cost-benefit analysis pursuant to RCW 34.05.328 and amend the SBEIS to provide additional economic impact information, including an estimate of the number of jobs that would be created or lost as a result of compliance with all the proposed rules, as required by RCW 19.85.040 (2)(d).

The Council provided the Committee with information and data on November 18, 2009. On December 2, 2009, the Committee found that the Council failed to adequately respond to the Committee's request for additional data. Specifically, the Committee found that the Council failed to amend the SBEIS to (a) estimate the number of jobs that would be created or lost as a result of compliance with the proposed changes; and (b) support the SBEIS with a detailed and rigorous costs analysis of the cumulative impact of all the changes. In addition, the Committee found that the Council failed

to provide the Committee with a cost-benefit analysis of the proposed changes and pursuant to the requirements of RCW 34.05.328.

The Committee strongly supports a process that makes thoughtful and informed progress towards changes that result in improved energy efficiency in our buildings, wherever practicable. While the Council worked diligently, it is the opinion of the Committee that the Council did not fully develop and consider the economic impacts and costs versus benefits of these significant changes to our Energy Code. Furthermore, it is the opinion of the Committee that the Council and the Legislature need this information to fully evaluate the value, impacts, and consequences of the proposed codes, with due diligence to their respective fiduciary responsibilities, in order to create the best informed public policy.

As a result, the Committee recommends that the Governor suspend the adoption and implementation of the changes to the Energy Code, Chapter 51-11 WAC, adopted by the Council on November 20, 2009, until such time as a more adequate analysis has been completed and considered by the appropriate bodies.

For all of the above stated reasons, the Committee objects to the changes to the State Energy Code, Chapter 51-11 WAC, that were adopted by the Council on November 20, 2009, and hereby directs the Code Reviser, pursuant to RCW 34.05.640(4), to publish this Notice of Objection in the Washington State Register and along with any publication in the Washington Administrative Code of changes to Chapter 51-11 WAC that were adopted by the Council in 2009 and filed with the Code Reviser.

WAC 51-11-1402 Mechanical ventilation. The minimum requirements for ventilation shall comply with the Washington State Mechanical Code (chapter 51-52 WAC).

[Statutory Authority: RCW 19.27A.025, 19.27A.045. 10-03-115, 10-13-113 and 10-22-056, § 51-11-1402, filed 1/20/10, 6/21/10 and 10/28/10, effective 1/1/11. Statutory Authority: RCW 19.27A.025. 93-21-052, § 51-11-1402, filed 10/18/93, effective 4/1/94.]

Reviser's note: Notice of Objection: The Joint Administrative Rules Review Committee (Committee) finds that, in adopting the 2009 proposed changes to the State Energy Code, Chapter 51-11 WAC, on November 20, 2009, the State Building Code Council (Council) failed to comply with all requirements of the law and failed to adequately respond to the Committee's request for additional economic impact and cost-benefit analyses prior to adoption.

On October 1, 2009, the Committee found that the Small Business Economic Impact Statement (SBEIS) for the proposed changes filed with the Code Reviser failed to comply with all requirements of law. The Committee requested that the Council conduct a cost-benefit analysis pursuant to RCW 34.05.328 and amend the SBEIS to provide additional economic impact information, including an estimate of the number of jobs that would be created or lost as a result of compliance with all the proposed rules, as required by RCW 19.85.040 (2)(d).

The Council provided the Committee with information and data on November 18, 2009. On December 2, 2009, the Committee found that the Council failed to adequately respond to the Committee's request for additional data. Specifically, the Committee found that the Council failed to amend the SBEIS to (a) estimate the number of jobs that would be created or lost as a result of compliance with the proposed changes; and (b) support the SBEIS with a detailed and rigorous costs analysis of the cumulative impact of all the changes. In addition, the Committee found that the Council failed to provide the Committee with a cost-benefit analysis of the proposed changes and pursuant to the requirements of RCW 34.05.328.

The Committee strongly supports a process that makes thoughtful and informed progress towards changes that result in improved energy efficiency in our buildings, wherever practicable. While the Council worked diligently, it is the opinion of the Committee that the Council did not fully develop and consider the economic impacts and costs versus benefits of these significant changes to our Energy Code. Furthermore, it is the opinion of the Committee that the Council and the Legislature need this information to fully evaluate the value, impacts, and consequences of the proposed codes, with due diligence to their respective fiduciary responsibilities, in order to create the best informed public policy.

As a result, the Committee recommends that the Governor suspend the adoption and implementation of the changes to the Energy Code, Chapter 51-11 WAC, adopted by the Council on November 20, 2009, until such time as a more adequate analysis has been completed and considered by the appropriate bodies.

For all of the above stated reasons, the Committee objects to the changes to the State Energy Code, Chapter 51-11 WAC, that were adopted by the Council on November 20, 2009, and hereby directs the Code Reviser, pursuant to RCW 34.05.640(4), to publish this Notice of Objection in the Washington State Register and along with any publication in the Washington Administrative Code of changes to Chapter 51-11 WAC that were adopted by the Council in 2009 and filed with the Code Reviser.

WAC 51-11-1410 General requirements. The mechanical system shall comply with Sections 1411 through 1416, Sections 1440 through 1443 and Sections 1450 through 1454, and with one of the following paths:

a. Simple Systems (Packaged Unitary Equipment) Sections 1420 through 1424.
b. Complex Systems Sections 1430 through 1439.
c. Systems Analysis. See Section 1141.4.

Systems serving cold storage spaces and frozen storage spaces in refrigerated warehouses shall meet the requirements of Sections 1416, 1437 and 1460.

FIGURE 14A
Mechanical Systems Compliance Paths

Section Number	Subject	Simple Systems Path	Complex Systems Path	Systems Analysis Option
1410	General Requirements	X	X	X
1411	HVAC Equipment Performance Requirements	X	X	X
1412	Controls	X	X	X
1413	Air Economizers	X	X	X
1414	Ducting Systems	X	X	X
1415	Piping Systems	X	X	X
1416	Completion Requirements	X	X	X
1420	Simple Systems (Packaged Unitary Equipment)	X		
1421	System Type	X		
1422	Controls	X		
1423	Economizers	X		
1424	Separate Air Distribution Systems	X		
1430	Complex Systems		X	
1431	System Type		X	
1432	Controls		X	

Section Number	Subject	Simple Systems Path	Complex Systems Path	Systems Analysis Option
1433	Economizers		X	
1434	Separate Air Distribution Systems		X	
1435	Simultaneous Heating and Cooling		X	
1436	Heat Recovery		X	
1437	Electric Motor Efficiency		X	
1438	Variable Flow Systems		X	
1439	Exhaust Hoods		X	
RS-29	Systems Analysis			X
1440	Domestic Water System	X	X	X
1441	Water Heater Installation	X	X	X
1442	Shut Off Controls	X	X	X
1443	Pipe Insulation	X	X	X
1444	Conservation of Water and Pumping Energy	X	X	X
1445	Heat Recovery for Domestic Water Systems	X	X	X
1446	Domestic Hot Water Meters	X	X	X
1450	Heated Pools	X	X	X
1451	General	X	X	X
1452	Pool Water Heaters	X	X	X
1453	Controls	X	X	X
1454	Pool Covers	X	X	X
1455	Heat Recovery	X	X	X
1460	Cold Storage	X	X	X
1461	Refrigerated Warehouse Heating and Cooling	X	X	X
1462	Underslab Heating	X	X	X
1463	Evaporators	X	X	X
1464	Condensers	X	X	X
1465	Compressors	X	X	X

[Statutory Authority: RCW 19.27A.025, 19.27A.045. 10-03-115, 10-13-113 and 10-22-056, § 51-11-1410, filed 1/20/10, 6/21/10 and 10/28/10, effective 1/1/11; 01-03-010, § 51-11-1410, filed 1/5/01, effective 7/1/01. Statutory Authority: RCW 19.27A.025. 93-21-052, § 51-11-1410, filed 10/18/93, effective 4/1/94.]

Reviser's note: Notice of Objection: The Joint Administrative Rules Review Committee (Committee) finds that, in adopting the 2009 proposed changes to the State Energy Code, Chapter 51-11 WAC, on November 20, 2009, the State Building Code Council (Council) failed to comply with all requirements of the law and failed to adequately respond to the Committee's request for additional economic impact and cost-benefit analyses prior to adoption.

On October 1, 2009, the Committee found that the Small Business Economic Impact Statement (SBEIS) for the proposed changes filed with the Code Reviser failed to comply with all requirements of law. The Committee requested that the Council conduct a cost-benefit analysis pursuant to RCW 34.05.328 and amend the SBEIS to provide additional economic impact information, including an estimate of the number of jobs that would be created or lost as a result of compliance with all the proposed rules, as required by RCW 19.85.040 (2)(d).

The Council provided the Committee with information and data on November 18, 2009. On December 2, 2009, the Committee found that the Council failed to adequately respond to the Committee's request for additional data. Specifically, the Committee found that the Council failed to amend the SBEIS to (a) estimate the number of jobs that would be created or lost as a result of compliance with the proposed changes; and (b) support the SBEIS with a detailed and rigorous costs analysis of the cumulative impact of all the changes. In addition, the Committee found that the Council failed to provide the Committee with a cost-benefit analysis of the proposed changes and pursuant to the requirements of RCW 34.05.328.

The Committee strongly supports a process that makes thoughtful and informed progress towards changes that result in improved energy efficiency in our buildings, wherever practicable. While the Council worked diligently, it is the opinion of the Committee that the Council did not fully develop and consider the economic impacts and costs versus benefits of these significant changes to our Energy Code. Furthermore, it is the opinion of the Committee that the Council and the Legislature need this information to fully evaluate the value, impacts, and consequences of the proposed codes, with due diligence to their respective fiduciary responsibilities, in order to create the best informed public policy.

As a result, the Committee recommends that the Governor suspend the adoption and implementation of the changes to the Energy Code, Chapter 51-11 WAC, adopted by the Council on November 20, 2009, until such time as a more adequate analysis has been completed and considered by the appropriate bodies.

For all of the above stated reasons, the Committee objects to the changes to the State Energy Code, Chapter 51-11 WAC, that were adopted by the Council on November 20, 2009, and hereby directs the Code Reviser, pursuant to RCW 34.05.640(4), to publish this Notice of Objection in the Washington State Register and along with any publication in the Washington Administrative Code of changes to Chapter 51-11 WAC that were adopted by the Council in 2009 and filed with the Code Reviser.

WAC 51-11-1411 HVAC equipment performance requirements.

1411.1 General: Equipment shall have a minimum performance at the specified rating conditions not less than the values shown in Tables 14-1A through 14-1G. If a nationally recognized certification program exists for a product covered in Tables 14-1A through 14-1G, and it includes provisions for verification and challenge of equipment efficiency ratings, then the product shall be listed in the certification program.

For equipment not within the scope of the standards in Table 14-1A through 14-1G, this Code does not contain any minimum efficiency requirements. However, for any claims of efficiency, such as for calculations using the RS-29 compliance option, data shall be furnished by the equipment manufacturer consisting of a complete report from a test per-

formed by an independent laboratory accredited by a nationally recognized accreditation organization.

Gas-fired and oil-fired forced air furnaces with input ratings ≥ 225,000 Btu/h (65 kW) and all unit heaters shall also have an intermittent ignition or interrupted device (IID), and have either mechanical draft (including power venting) or a flue damper. A vent damper is an acceptable alternative to a flue damper for furnaces where combustion air is drawn from the conditioned space. All furnaces with input ratings ≥ 225,000 Btu/h (65 kW), including electric furnaces, that are not located within the conditioned space shall have jacket losses not exceeding 0.75% of the input rating.

Chilled water plants and buildings with more than 500 tons total capacity shall not have more than 100 tons provided by air-cooled chillers.

EXCEPTIONS: 1. Where the designer demonstrates that the water quality at the building site fails to meet manufacturer's specifications for the use of water-cooled equipment.

2. Air-cooled chillers with minimum efficiencies at least 10 percent higher than those listed in Table 14-1C.

3. Replacement of existing equipment.

1411.2 Rating Conditions: Cooling equipment shall be rated at AHRI test conditions and procedures when available. Where no applicable procedures exist, data shall be furnished by the equipment manufacturer consisting of a complete report from a test performed by an independent laboratory accredited by a nationally recognized accreditation organization.

1411.2.1 Water-Cooled Centrifugal Water-Chilling Packages—Nonstandard Conditions: Water-cooled centrifugal water-chilling packages that are not designed for operation at AHRI Standard 550/590 test conditions reflected in Table 14-1C (44°F leaving chilled-water temperature and 85°F entering condenser water temperature with 3 gpm/ton condenser water flow) shall have maximum full-load kW/ton and NPLV ratings adjusted using the following equation:

Adjusted maximum full-load kW/ton rating = (Full load kW/ton from Table 14-1C)/K_{adj}

Adjusted maximum NPLV rating = (IPLV from Table 14-1C)/K_{adj}

Where:

K_{adj} = $6.174722 - 0.303668(X) + 0.00629466(X)^2 - 0.000045780(X)^3$

X = DT_{std} + LIFT

DT_{std} = (24 + [full load kW/ton from Table 14-1C] x 6.83)/Flow

Flow = Condenser water flow (gpm)/cooling full load capacity (tons)

LIFT = CEWT - CLWT

CEWT = Full load condenser entering water temperature (F)

CLWT = Full load condenser leaving chilled water temperature (F)

The adjusted full load and NPLV values are only applicable over the following full-load design ranges:

- Minimum leaving chilled water temperature: 38°F;
- Maximum condenser entering water temperature: 102°F;
- Condenser water flow: 1 to 6 gpm/ton; and
- X ≥39 and ≤60.

Chillers designed to operate outside of these ranges or applications utilizing fluids or solutions with secondary coolants (e.g., glycol solutions or brines) with a freeze point of 27°F or lower from freeze protection are not covered by this standard.

1411.3 Combination Space and Service Water Heating: For combination space and service water heaters with a principal function of providing space heat, the Combined Annual Efficiency (CAE) may be calculated by using ASHRAE Standard 124-1991. Storage water heaters used in combination space heat and water heat applications shall have either an Energy Factor (EF) or a Combined Annual Efficiency (CAE) of not less than the following:

	Energy Factor (EF)	Combined Annual Efficiency (CAE)
< 50 gallon storage	0.58	0.71
50 to 70 gallon storage	0.57	0.71
> 70 gallon storage	0.55	0.70

1411.4 Packaged Electric Heating and Cooling Equipment: Packaged electric equipment providing both heating and cooling with a total cooling capacity greater than 20,000 Btu/h shall be a heat pump.

EXCEPTION: Unstaffed equipment shelters or cabinets used solely for personal wireless service facilities.

1411.5 Heating Systems in Unenclosed Spaces: Where comfort heating is provided to unenclosed spaces, only radiant heating systems shall be used unless otherwise approved by the building official. The heating system shall be controlled by an occupancy sensor. An unenclosed space is one that is not substantially surrounded by solid surfaces such as walls, floors, roofs, and openable devices such as doors and operable windows. Warehouses and repair garages are considered enclosed spaces.

[Statutory Authority: RCW 19.27A.025, 19.27A.045. 10-03-115, 10-13-113 and 10-22-056, § 51-11-1411, filed 1/20/10, 6/21/10 and 10/28/10, effective 1/1/11. Statutory Authority: RCW 19.27A.022, 19.27A.025, 19.27A.045, and chapters 19.27 and 34.05 RCW. 07-01-089, § 51-11-1411, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27A.025, 19.27A.045. 02-01-112, § 51-11-1411, filed 12/18/01, effective 7/1/02; 01-03-010, § 51-11-1411, filed 1/5/01, effective 7/1/01; 98-03-003, § 51-11-1411, filed 1/8/98, effective 7/1/98. Statutory Authority: RCW 19.27A.025. 93-21-052, § 51-11-1411, filed 10/18/93, effective 4/1/94.]

Reviser's note: The brackets and enclosed material in the text of the above section occurred in the copy filed by the agency.

Reviser's note: Notice of Objection: The Joint Administrative Rules Review Committee (Committee) finds that, in adopting the 2009 proposed changes to the State Energy Code, Chapter 51-11 WAC, on November 20, 2009, the State Building Code Council (Council) failed to comply with all requirements of the law and failed to adequately respond to the Committee's

request for additional economic impact and cost-benefit analyses prior to adoption.

On October 1, 2009, the Committee found that the Small Business Economic Impact Statement (SBEIS) for the proposed changes filed with the Code Reviser failed to comply with all requirements of law. The Committee requested that the Council conduct a cost-benefit analysis pursuant to RCW 34.05.328 and amend the SBEIS to provide additional economic impact information, including an estimate of the number of jobs that would be created or lost as a result of compliance with all the proposed rules, as required by RCW 19.85.040 (2)(d).

The Council provided the Committee with information and data on November 18, 2009. On December 2, 2009, the Committee found that the Council failed to adequately respond to the Committee's request for additional data. Specifically, the Committee found that the Council failed to amend the SBEIS to (a) estimate the number of jobs that would be created or lost as a result of compliance with the proposed changes; and (b) support the SBEIS with a detailed and rigorous costs analysis of the cumulative impact of all the changes. In addition, the Committee found that the Council failed to provide the Committee with a cost-benefit analysis of the proposed changes and pursuant to the requirements of RCW 34.05.328.

The Committee strongly supports a process that makes thoughtful and informed progress towards changes that result in improved energy efficiency in our buildings, wherever practicable. While the Council worked diligently, it is the opinion of the Committee that the Council did not fully develop and consider the economic impacts and costs versus benefits of these significant changes to our Energy Code. Furthermore, it is the opinion of the Committee that the Council and the Legislature need this information to fully evaluate the value, impacts, and consequences of the proposed codes, with due diligence to their respective fiduciary responsibilities, in order to create the best informed public policy.

As a result, the Committee recommends that the Governor suspend the adoption and implementation of the changes to the Energy Code, Chapter 51-11 WAC, adopted by the Council on November 20, 2009, until such time as a more adequate analysis has been completed and considered by the appropriate bodies.

For all of the above stated reasons, the Committee objects to the changes to the State Energy Code, Chapter 51-11 WAC, that were adopted by the Council on November 20, 2009, and hereby directs the Code Reviser, pursuant to RCW 34.05.640(4), to publish this Notice of Objection in the Washington State Register and along with any publication in the Washington Administrative Code of changes to Chapter 51-11 WAC that were adopted by the Council in 2009 and filed with the Code Reviser.

WAC 51-11-1412 Controls.

1412.1 Temperature Controls: Each system shall be provided with at least one temperature control device. Each zone shall be controlled by individual thermostatic controls responding to temperature within the zone. At a minimum, each floor of a building shall be considered as a separate zone. Controls on systems required to have economizers and serving single zones shall have multiple cooling stage capability and that activate the economizer when appropriate as the first stage of cooling. See Section 1423 or 1433 for further economizer control requirements.

1412.2 Deadband Controls: When used to control both comfort heating and cooling, zone thermostatic controls shall be capable of a deadband of at least 5 degrees F within which the supply of heating and cooling energy to the zone is shut off or reduced to a minimum.

EXCEPTIONS:
1. Special occupancy, special usage, or code requirements where deadband controls are not appropriate.
2. Thermostats that require manual changeover between heating and cooling modes.

1412.3 Humidity Controls: If a system is equipped with a means for adding moisture, a humidistat shall be provided.

1412.4 Setback and Shutoff: HVAC systems shall be equipped with automatic controls capable of accomplishing a reduction of energy use through control setback or equipment shutdown during periods of nonuse or alternate use of the spaces served by the system. The automatic controls shall:

a. Have a minimum seven-day clock and be capable of being set for seven different day types per week,

b. Be capable of retaining programming and time setting during loss of power for a period of at least ten hours, and

c. Include an accessible manual override, or equivalent function (e.g., telephone interface), that allows temporary operation of the system for up to two hours.

EXCEPTIONS:
1. Systems serving areas which require continuous operation at the same temperature setpoint.
2. Equipment with full load demands of 2 Kw (6,826 Btu/h) or less may be controlled by readily accessible manual off-hour controls.
3. Systems controlled by an occupant sensor that is capable of shutting the system off when no occupant is sensed for a period of up to 30 minutes.
4. Systems controlled solely by a manually operated timer capable of operating the system for no more than two hours.

For hotel and motel guest rooms, a minimum of one of the following control technologies shall be required in hotels/motels with over 50 guest rooms such that the space temperature would automatically setback (winter) or set up (summer) by no less than 3°C (5°F) when the occupant is not in the room:

1. Controls that are activated by the room occupant via the primary room access method - key, card, deadbolt, etc.

2. Occupancy sensor controls that are activated by the occupant's presence in the room.

1412.4.1 Dampers: Outside air intakes, exhaust outlets and relief outlets serving conditioned spaces shall be equipped with motorized dampers which close automatically when the system is off or upon power failure. Return air dampers shall be equipped with motorized dampers. Stair shaft and elevator shaft smoke relief openings shall be equipped with normally open (fails to open upon loss of power) dampers. These dampers shall remain closed until activated by the fire alarm system or other approved smoke detection system.

EXCEPTIONS:
1. Systems serving areas which require continuous operation.
2. Combustion air intakes.
3. Gravity (nonmotorized) relief dampers are acceptable in equipment with less than 5,000 cfm total supply flow when in buildings less than 3 stories in height.
4. Type 1 grease hoods exhaust.

Dampers installed to comply with this section, including dampers integral to HVAC equipment, shall have a maximum leakage rate when tested in accordance with AMCA Standard 500 of:

(a) Motorized dampers: 10 cfm/ft^2 of damper area at 1.0 in w.g.

(b) Nonmotorized dampers: 20 cfm/ft^2 of damper area at 1.0 in w.g., except that for nonmotorized dampers smaller than 24 inches in either dimension: 40 cfm/ft^2 of damper area at 1.0 in w.g.

Drawings shall indicate compliance with this section.

1412.4.1.1 Damper Controls: Dampers for outdoor air supply and exhaust shall automatically shut when the systems or spaces served are not in use or during building warm-up, cooldown, and setback. Operation of dampers shall be

allowed during ventilation prepurge one hour before expected occupancy and for unoccupied period precooling during the cooling season.

Classrooms, gyms, auditoriums and conference rooms larger than 500 square feet of floor area shall have occupancy sensor control that will either close outside air dampers or turn off serving equipment when the space is unoccupied except where equipped with another means to automatically reduce outside air intake below design rates when spaces are partially occupied.

1412.4.2 Optimum Start Controls: Heating and cooling systems with design supply air capacities exceeding 2,000 cfm shall have optimum start controls. Optimum start controls shall be designed to automatically adjust the start time of an HVAC system each day to bring the space to desired occupied temperature levels immediately before scheduled occupancy. The control algorithm shall, as a minimum, be a function of the difference between space temperature and occupied setpoint and the amount of time prior to scheduled occupancy.

1412.5 Heat Pump Controls: Unitary air cooled heat pumps shall include microprocessor controls that minimize supplemental heat usage during start up, set-up, and defrost conditions. These controls shall anticipate need for heat and use compression heating as the first stage of heat. Controls shall indicate when supplemental heating is being used through visual means (e.g., LED indicators). Heat pumps equipped with supplementary heaters shall be installed with controls that prevent supplemental heater operation above 40°F.

1412.6 Combustion Heating Equipment Controls: Combustion heating equipment with a capacity over 225,000 Btu/h shall have modulating or staged combustion control.

EXCEPTIONS: Boilers.
Radiant heaters.

1412.7 Balancing: Each air supply outlet or air or water terminal device shall have a means for balancing, including but not limited to, dampers, temperature and pressure test connections and balancing valves.

1412.8 Ventilation Controls for High-Occupancy Areas. Demand control ventilation (DCV) is required for spaces that are larger than 500 ft^2, have an occupant density for ventilation of greater than 25 people per 1000 ft^2 of floor area (based on the Default Occupant Density column of Table 403.3 of the Washington State Mechanical Code), and are served by systems with one or more of the following:

a. An air-side economizer,

b. Automatic modulating control of the outdoor air damper, or

c. A design outdoor ventilation airflow of all systems serving the space combined greater than 3000 cfm.

EXCEPTIONS: 1. Systems with energy recovery complying with Section 1436.
2. Spaces with a combined design outdoor airflow less than 1000 cfm.
3. Spaces where the supply airflow rate minus any makeup or outgoing transfer air requirement is less than 1000 cfm.

1412.9 Enclosed Loading Dock and Parking Garage Exhaust Ventilation System Control. Mechanical ventilation systems for enclosed loading docks and parking garages shall be designed to exhaust the airflow rates (maximum and minimum) determined in accordance with the State Mechanical Code (chapter 51-52 WAC).

Ventilation systems shall be equipped with a control device that operates the system automatically upon detection of vehicle operation or the presence of occupants by approved automatic detection devices. Each of the following types of controllers shall be capable of shutting off fans or modulating fan speed.

1. Gas sensor controllers used to activate the exhaust ventilation system shall stage or modulate fan speed upon detection of specified gas levels. All equipment used in sensor controlled systems shall be designed for the specific use and installed in accordance with the manufacturer's recommendations. The following are minimum gas sensor system requirements:

a. Garages and loading docks used predominantly by gasoline-powered vehicles shall be equipped with a controller and a full array of carbon monoxide (CO) sensors set to maintain levels of carbon monoxide below 35 parts per million (ppm). Spacing and location of the sensors shall be installed in accordance with manufacturer recommendations.

b. Where more than 20 percent of the vehicles using the garage or loading dock are powered by nongasoline fuels, the area exposed to nongasoline fueled vehicle exhaust shall be equipped with a controller and fuel-appropriate sensors. The set-point for the nongasoline sensors shall be no less than the standard used by OSHA for eight hour exposure. The controller shall activate the ventilation system when sensor set-point is reached. Spacing and location of the sensors shall be installed in accordance with manufacturer recommendations.

2. Automatic time clocks used to activate the system shall activate the system during occupied periods. The time clock shall be capable of scheduling multiple start and stop times for each day of the week, varying the daily schedule, and retaining programming for a 10-hour period during loss of power.

3. Occupant detection sensors used to activate the system shall detect entry into the parking garage along both the vehicle and pedestrian pathways.

1412.9.1 System Activation Devices for Enclosed Loading Docks. Ventilation systems for enclosed loading docks shall be activated by one of the following:

1. Gas sensors; or

2. Time clock and a manual over-ride switch located in the dock area that is accessible to persons in the loading dock area.

1412.9.2 System Activation Devices for Enclosed Parking Garages. Ventilation systems for enclosed parking garages shall be activated by gas sensors.

EXCEPTION: A parking garage ventilation system having a total design capacity under 8,000 cfm may use a time clock or occupant sensors.

[Statutory Authority: RCW 19.27A.025, 19.27A.045. 10-03-115, 10-13-113 and 10-22-056, § 51-11-1412, filed 1/20/10, 6/21/10 and 10/28/10, effective

1/1/11. Statutory Authority: RCW 19.27A.022, 19.27A.025, 19.27A.045, and chapters 19.27 and 34.05 RCW. 07-01-089, § 51-11-1412, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27A.020, 19.27A.-045. 04-01-106, § 51-11-1412, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27A.025, 19.27A.045. 02-01-112, § 51-11-1412, filed 12/18/01, effective 7/1/02; 01-03-010, § 51-11-1412, filed 1/5/01, effective 7/1/01; 98-03-003, § 51-11-1412, filed 1/8/98, effective 7/1/98. Statutory Authority: RCW 19.27A.025. 93-21-052, § 51-11-1412, filed 10/18/93, effective 4/1/94.]

Reviser's note: Notice of Objection: The Joint Administrative Rules Review Committee (Committee) finds that, in adopting the 2009 proposed changes to the State Energy Code, Chapter 51-11 WAC, on November 20, 2009, the State Building Code Council (Council) failed to comply with all requirements of the law and failed to adequately respond to the Committee's request for additional economic impact and cost-benefit analyses prior to adoption.

On October 1, 2009, the Committee found that the Small Business Economic Impact Statement (SBEIS) for the proposed changes filed with the Code Reviser failed to comply with all requirements of law. The Committee requested that the Council conduct a cost-benefit analysis pursuant to RCW 34.05.328 and amend the SBEIS to provide additional economic impact information, including an estimate of the number of jobs that would be created or lost as a result of compliance with all the proposed rules, as required by RCW 19.85.040 (2)(d).

The Council provided the Committee with information and data on November 18, 2009. On December 2, 2009, the Committee found that the Council failed to adequately respond to the Committee's request for additional data. Specifically, the Committee found that the Council failed to amend the SBEIS to (a) estimate the number of jobs that would be created or lost as a result of compliance with the proposed changes; and (b) support the SBEIS with a detailed and rigorous costs analysis of the cumulative impact of all the changes. In addition, the Committee found that the Council failed to provide the Committee with a cost-benefit analysis of the proposed changes and pursuant to the requirements of RCW 34.05.328.

The Committee strongly supports a process that makes thoughtful and informed progress towards changes that result in improved energy efficiency in our buildings, wherever practicable. While the Council worked diligently, it is the opinion of the Committee that the Council did not fully develop and consider the economic impacts and costs versus benefits of these significant changes to our Energy Code. Furthermore, it is the opinion of the Committee that the Council and the Legislature need this information to fully evaluate the value, impacts, and consequences of the proposed codes, with due diligence to their respective fiduciary responsibilities, in order to create the best informed public policy.

As a result, the Committee recommends that the Governor suspend the adoption and implementation of the changes to the Energy Code, Chapter 51-11 WAC, adopted by the Council on November 20, 2009, until such time as a more adequate analysis has been completed and considered by the appropriate bodies.

For all of the above stated reasons, the Committee objects to the changes to the State Energy Code, Chapter 51-11 WAC, that were adopted by the Council on November 20, 2009, and hereby directs the Code Reviser, pursuant to RCW 34.05.640(4), to publish this Notice of Objection in the Washington State Register and along with any publication in the Washington Administrative Code of changes to Chapter 51-11 WAC that were adopted by the Council in 2009 and filed with the Code Reviser.

WAC 51-11-1413 Economizers.

1413.1 Operation: Air economizers shall be capable of automatically modulating outside and return air dampers to provide 100 percent of the design supply air as outside air to reduce or eliminate the need for mechanical cooling. Systems shall provide a means to relieve excess outdoor air during air economizer operation to prevent overpressurizing the building. Air economizers shall be used for RS-29 analysis base case for all systems without exceptions in Sections 1413, 1423, or 1433. Water economizers, when allowed by Section 1132.2 exception 1 or Section 1433 exceptions 3 and 9, shall be capable of providing the total concurrent cooling load served by the connected terminal equipment lacking airside economizer, at outside air temperatures of 50°F dry-bulb/45°F wet-bulb and below. For this calculation, all factors including solar and internal load shall be the same as those used for peak load calculations, except for the outside temperatures.

1413.2 **Documentation:** Water economizer plans submitted for approval shall include the following information:

1. Maximum outside air conditions for which economizer is sized to provide full cooling.
2. Design cooling load to be provided by economizer at this outside air condition.
3. Heat rejection and terminal equipment performance data including model number, flow rate, capacity, entering and leaving temperature in full economizer cooling mode.

1413.3 Integrated Operation: The HVAC system and its controls shall allow economizer operation when mechanical cooling is required simultaneously. Air and water economizers shall be capable of providing partial cooling even when additional mechanical cooling is required to meet the remainder of the cooling load.

EXCEPTIONS:
1. Individual, direct expansion units that have a rated capacity less than 65,000 Btu/h and use nonintegrated economizer controls that preclude simultaneous operation of the economizer and mechanical cooling.
2. Water-cooled water chillers with waterside economizer.

1413.4 **Humidification:** If an air economizer is required on a cooling system for which humidification equipment is to be provided to maintain minimum indoor humidity levels, then the humidifier shall be of the adiabatic type (direct evaporative media or fog atomization type).

EXCEPTIONS:
1. Health care facilities where WAC 246-320-525 allows only steam injection humidifiers in ductwork downstream of final filters.
2. Systems with water economizer.
3. 100% outside air systems with no provisions for air recirculation to the central supply fan.
4. Nonadiabatic humidifiers cumulatively serving no more than 10% of a building's air economizer capacity as measured in cfm. This refers to the system cfm serving rooms with stand alone or duct mounted humidifiers.

[Statutory Authority: RCW 19.27A.025, 19.27A.045. 10-03-115, 10-13-113 and 10-22-056, § 51-11-1413, filed 1/20/10, 6/21/10 and 10/28/10, effective 1/1/11. Statutory Authority: RCW 19.27A.025, 19.27A.045 and chapters 19.27, 19.27A, and 34.05 RCW. 05-01-013, § 51-11-1413, filed 12/2/04, effective 7/1/05. Statutory Authority: RCW 19.27A.025, 19.27A.045. 02-01-112, § 51-11-1413, filed 12/18/01, effective 7/1/02. Statutory Authority: RCW 19.27A.025. 93-21-052, § 51-11-1413, filed 10/18/93, effective 4/1/94.]

Reviser's note: Notice of Objection: The Joint Administrative Rules Review Committee (Committee) finds that, in adopting the 2009 proposed changes to the State Energy Code, Chapter 51-11 WAC, on November 20, 2009, the State Building Code Council (Council) failed to comply with all requirements of the law and failed to adequately respond to the Committee's request for additional economic impact and cost-benefit analyses prior to adoption.

On October 1, 2009, the Committee found that the Small Business Economic Impact Statement (SBEIS) for the proposed changes filed with the Code Reviser failed to comply with all requirements of law. The Committee requested that the Council conduct a cost-benefit analysis pursuant to RCW 34.05.328 and amend the SBEIS to provide additional economic impact information, including an estimate of the number of jobs that would be created or lost as a result of compliance with all the proposed rules, as required by RCW 19.85.040 (2)(d).

The Council provided the Committee with information and data on November 18, 2009. On December 2, 2009, the Committee found that the Council failed to adequately respond to the Committee's request for addi-

tional data. Specifically, the Committee found that the Council failed to amend the SBEIS to (a) estimate the number of jobs that would be created or lost as a result of compliance with the proposed changes; and (b) support the SBEIS with a detailed and rigorous costs analysis of the cumulative impact of all the changes. In addition, the Committee found that the Council failed to provide the Committee with a cost-benefit analysis of the proposed changes and pursuant to the requirements of RCW 34.05.328.

The Committee strongly supports a process that makes thoughtful and informed progress towards changes that result in improved energy efficiency in our buildings, wherever practicable. While the Council worked diligently, it is the opinion of the Committee that the Council did not fully develop and consider the economic impacts and costs versus benefits of these significant changes to our Energy Code. Furthermore, it is the opinion of the Committee that the Council and the Legislature need this information to fully evaluate the value, impacts, and consequences of the proposed codes, with due diligence to their respective fiduciary responsibilities, in order to create the best informed public policy.

As a result, the Committee recommends that the Governor suspend the adoption and implementation of the changes to the Energy Code, Chapter 51-11 WAC, adopted by the Council on November 20, 2009, until such time as a more adequate analysis has been completed and considered by the appropriate bodies.

For all of the above stated reasons, the Committee objects to the changes to the State Energy Code, Chapter 51-11 WAC, that were adopted by the Council on November 20, 2009, and hereby directs the Code Reviser, pursuant to RCW 34.05.640(4), to publish this Notice of Objection in the Washington State Register and along with any publication in the Washington Administrative Code of changes to Chapter 51-11 WAC that were adopted by the Council in 2009 and filed with the Code Reviser.

WAC 51-11-1414 Ducting systems.

1414.1 Duct Sealing and Testing: Duct work and plenums shall be sealed in accordance with Section 1414.1.1. Additionally, ducts shall be tested in accordance with Sections 1414.1.2 and 1414.1.3 as required.

1414.1.1 Sealing: Duct work which is designed to operate at pressures above 1/2 inch water column static pressure shall be sealed as follows:

1. Static pressure 1/2 inch to 3 inches: Seal all transverse joints and longitudinal seams. Spiral lock seams in round and flat oval duct work do not require sealing; however, other seams shall be sealed.
2. Static pressure above 3 inches: Seal all transverse joints, longitudinal seams and duct wall penetrations.

All low pressure supply and return air systems not located entirely within the conditioned space, including the unconditioned side of enclosed stud bays or joist cavities/spaces used to transport air, shall be securely fastened and sealed. Duct work shall be sealed using welds, gaskets, mastic, or mastic-plus-embedded-fabric tape. Enclosed stud bays or joist cavities/spaces used to transport air shall be sealed using mastic-plus-embedded-fabric tape, or when drywall is used to enclose the air system, drywall mud and tape. Duct tape is not permitted as a sealant on any ducts.

EXCEPTION: Fibrous glass duct systems installed in accordance with Standard UL 181A and flexible duct systems installed in accordance with Standard UL 181B may use tapes listed for these systems.

1414.1.2 Low Pressure Duct Leak Test: All duct systems shall be sealed to a leakage rate not to exceed 6 percent of the fan flow if the duct system:

1. Is connected to a constant volume, single zone, air conditioner, heat pump or furnace; and
2. Serves less than 5,000 square feet of floor area; and
3. Has more than 25 percent duct surface area located in any unconditioned space.

The leakage rate shall be confirmed through field verification and diagnostic testing, in accordance with SMACNA Duct Leakage Test Procedures - 1985.

1414.1.3 High Pressure Duct Leak Test: Duct work that is designed to operate at static pressures in excess of 3 inches water column shall be leak-tested in accordance with SMACNA Duct Leakage Test Procedures - 1985. Representative sections totaling no less than 25 percent of the total installed duct area for the designated pressure class shall be tested. Duct systems with pressure ratings in excess of 3 in. w.c. shall be identified on the drawings. The maximum permitted duct leakage shall be:

$$L_{max} = C_L P^{0.65}$$

Where:

L_{max}	=	Maximum permitted leakage in cfm/100 ft^2 duct surface area.
C_L	=	Duct leakage class, cfm/100 ft^2 at 1 in. w.c.
C_L	=	6 for rectangular sheet metal, rectangular fibrous, and round flexible ducts.
C_L	=	3 for round/flat oval sheet metal or fibrous glass ducts.
P	=	Test pressure, which shall be equal to the design duct pressure class rating in in. w.c.

1414.2 Insulation: Ducts and plenums that are constructed and function as part of the building envelope, by separating interior space from exterior space, shall meet all applicable requirements of Chapter 13. These requirements include insulation installation, moisture control, air leakage, and building envelope insulation levels. Unheated equipment rooms with combustion air louvers must be isolated from the conditioned space by insulating interior surfaces to a minimum of R-11 and any exterior envelope surfaces per Chapter 13. Outside air ducts serving individual supply air units with less than 2,800 cfm of total supply air capacity shall be insulated to a minimum of R-7 and are not considered building envelope. Other outside air duct runs are considered building envelope until they,

1. Connect to the heating or cooling equipment, or
2. Are isolated from the exterior with an automatic shut-off damper complying with Section 1412.4.1.

Once outside air ducts meet the above listed requirements, any runs within conditioned space shall comply with Table 14-5 requirements.

Other ducts and plenums shall be thermally insulated per Table 14-5.

EXCEPTIONS: 1. Within the HVAC equipment.
2. Exhaust air ducts not subject to condensation.
3. Exposed ductwork within a zone that serves that zone.

[Statutory Authority: RCW 19.27A.025, 19.27A.045. 10-03-115, 10-13-113 and 10-22-056, § 51-11-1414, filed 1/20/10, 6/21/10 and 10/28/10, effective 1/1/11; 01-03-010, § 51-11-1414, filed 1/5/01, effective 7/1/01; 98-03-003, § 51-11-1414, filed 1/8/98, effective 7/1/98. Statutory Authority: RCW 19.27A.025. 93-21-052, § 51-11-1414, filed 10/18/93, effective 4/1/94.]

Reviser's note: Notice of Objection: The Joint Administrative Rules Review Committee (Committee) finds that, in adopting the 2009 proposed changes to the State Energy Code, Chapter 51-11 WAC, on November 20, 2009, the State Building Code Council (Council) failed to comply with all requirements of the law and failed to adequately respond to the Committee's request for additional economic impact and cost-benefit analyses prior to adoption.

On October 1, 2009, the Committee found that the Small Business Economic Impact Statement (SBEIS) for the proposed changes filed with the Code Reviser failed to comply with all requirements of law. The Committee requested that the Council conduct a cost-benefit analysis pursuant to RCW 34.05.328 and amend the SBEIS to provide additional economic impact information, including an estimate of the number of jobs that would be created or lost as a result of compliance with all the proposed rules, as required by RCW 19.85.040 (2)(d).

The Council provided the Committee with information and data on November 18, 2009. On December 2, 2009, the Committee found that the Council failed to adequately respond to the Committee's request for additional data. Specifically, the Committee found that the Council failed to amend the SBEIS to (a) estimate the number of jobs that would be created or lost as a result of compliance with the proposed changes; and (b) support the SBEIS with a detailed and rigorous costs analysis of the cumulative impact of all the changes. In addition, the Committee found that the Council failed to provide the Committee with a cost-benefit analysis of the proposed changes and pursuant to the requirements of RCW 34.05.328.

The Committee strongly supports a process that makes thoughtful and informed progress towards changes that result in improved energy efficiency in our buildings, wherever practicable. While the Council worked diligently, it is the opinion of the Committee that the Council did not fully develop and consider the economic impacts and costs versus benefits of these significant changes to our Energy Code. Furthermore, it is the opinion of the Committee that the Council and the Legislature need this information to fully evaluate the value, impacts, and consequences of the proposed codes, with due diligence to their respective fiduciary responsibilities, in order to create the best informed public policy.

As a result, the Committee recommends that the Governor suspend the adoption and implementation of the changes to the Energy Code, Chapter 51-11 WAC, adopted by the Council on November 20, 2009, until such time as a more adequate analysis has been completed and considered by the appropriate bodies.

For all of the above stated reasons, the Committee objects to the changes to the State Energy Code, Chapter 51-11 WAC, that were adopted by the Council on November 20, 2009, and hereby directs the Code Reviser, pursuant to RCW 34.05.640(4), to publish this Notice of Objection in the Washington State Register and along with any publication in the Washington Administrative Code of changes to Chapter 51-11 WAC that were adopted by the Council in 2009 and filed with the Code Reviser.

WAC 51-11-1416 Commissioning and completion requirements.

1416.1 General. Drawing notes or specifications shall require commissioning and completion requirements in accordance with this section.

1416.2 Commissioning Scope. Commissioning in compliance with this section and Section 1513.8 shall be required for new systems or modified portions of systems, with a heating capacity of 600K Btu/h or a cooling capacity of 40 tons or more.

1416.2.1 Buildings which require commissioning shall go through a commissioning process that includes as a minimum:

1. Commissioning plan;
2. Systems testing and balancing;
3. HVAC equipment and HVAC controls functional testing;
4. Supporting documentation in the form of operation and maintenance and record documents;
5. Commissioning report.

1416.3 Commissioning Requirements.

1416.3.1 Commissioning Plan. Commissioning plan shall include:

1. A general description of the commissioning process activities including the systems to be commissioned;
2. The scope of the commissioning process including systems testing and balancing, functional testing, and supporting documentation;
3. Roles and responsibilities of the commissioning team;
4. A schedule of activities including systems testing and balancing, functional testing, and supporting documentation;
5. Functional test procedures and forms.

1416.3.2 Systems Testing and Balancing.

1416.3.2.1 General. All HVAC air and hydronic systems shall be balanced in accordance with generally accepted engineering standards.

1416.3.2.2 Air Systems Balancing. Throttling losses shall be minimized by balancing the systems or adjusting the speed of fans with motors greater than 1 hp.

1416.3.2.3 Hydronic Systems Balancing. Throttling losses shall be minimized by balancing the systems, or trimming the pump impeller or adjusting the pump speed.

EXCEPTIONS:
1. Pumps with pump motors of 10 hp or less.
2. Throttling is an acceptable method of balancing only if the power draw does not exceed that of equivalent system with the impeller trimmed by more than 5 percent.

All hydronic heating or cooling coils with design flow exceeding 20 gpm (76 L/m) shall be equipped with dedicated pressure testing ports to enable testing of pressure drop through the coil. All hydronic heating or cooling systems served by pump(s) exceeding 5 hp (3.7 kW) shall be equipped with accessible pressure testing ports to enable testing supply and return pressure near the end of each major hydronic run.

1416.3.3 Systems, Equipment, and Controls Functional Testing. All HVAC systems, equipment, and controls as well as and lighting controls as specified in Section 1513.8 shall be tested to ensure that control devices, components, equipment and systems are calibrated, adjusted and operate in accordance with sequences of operation prescribed in the construction documents. Written procedures which clearly describe the individual systematic test procedures, the expected systems' response or acceptance criteria for each procedure, the actual response or findings, and any pertinent discussion. Optional examples of test methods and forms are provided in Reference Standard 34.

1416.3.4 Supporting Documentation. Supporting documentation shall include, as a minimum:

1416.3.4.1 Systems Documentation. Systems documentation shall be in accordance with industry accepted standards and shall include as a minimum:

1. Submittal data stating equipment size and selected options for each piece of equipment.

2. Operation and maintenance manuals for each piece of equipment requiring maintenance, except equipment not furnished as part of the project. Required routine maintenance actions shall be clearly identified.

3. Names and addresses of at least one HVAC service agency.

4. HVAC controls system maintenance and calibration information, including wiring diagrams, schematics, as-built drawings and control sequence descriptions. Desired or field determined set points shall be permanently recorded on control drawings at control devices, or, for digital control systems, in programming comments.

5. Complete written narrative of how each system and piece of equipment is intended to operate including interface with existing equipment or systems (where applicable). Sequence of operation is not acceptable as a narrative for this requirement.

1416.3.4.2 Record Documents. Construction documents shall be updated to convey a record of the alterations to the original design. Such updates shall include updated mechanical, electrical and control drawings red-lined, or redrawn if specified, that show all changes to size, type and location of components, equipment and assemblies.

1416.3.4.3 Systems Operation Training. Training of the maintenance staff for each equipment type and or system shall include as a minimum:

1. Review of systems documentation.

2. Hands-on demonstration of all normal maintenance procedures, normal operating modes, and all emergency shutdown and start-up procedures.

3. Training completion report.

1416.3.5 Commissioning Report. The commissioning report shall be completed and provided to the owner. The commissioning report shall include:

1. Completed Functional Test forms including measurable criteria for test acceptance.

2. Issues log of corrected and uncorrected deficiencies with the anticipated date of correction.

3. Deferred tests, which cannot be performed at the time of report preparation, with anticipated date of completion.

4. Record of progress and completion of operator training.

5. Completed Commissioning Compliance form.

1416.4 Commissioning Compliance Form. A commissioning compliance checklist shall be submitted to the building official upon substantial completion of the building. The checklist shall be completed and signed by the building owner or owner's representative. The building official may require that the Commissioning Compliance form components be submitted to verify compliance with Sections 1416 and 1513.8 requirements. Completion of the Commissioning Compliance Checklist (Figure 14B) is deemed to satisfy this requirement.

FIGURE 14B
COMMISSIONING COMPLIANCE CHECKLIST

Project Information	**Project Name:** **Project Address:** **Commissioning Authority:**
Commissioning Plan (Section 1416.3.1)	☐ **Commissioning Plan was used during construction and included items below** • A written schedule including Systems Testing and Balancing, Functional Testing, and Supporting Documentation. • Roles and Responsibilities of the commissioning team. • Functional Test procedures and forms.
Systems Balancing (Section 1416.3.2)	☐ **Systems Balancing has been completed** • Air and Hydronic systems are proportionately balanced in a manner to first minimize throttling losses. • Test ports are provided on each pump for measuring pressure across the pump.
Functional Testing (Section 1416.3.3)	☐ **HVAC Systems Functional Testing has been completed** (Section 1416.3.3) HVAC systems have been tested to ensure that equipment, components, and subsystems are installed, calibrated, adjusted and operate in accordance with approved plans and specifications. ☐ **HVAC Controls Functional Testing has been completed** (Section 1416.3.3) HVAC controls have been tested to ensure that control devices are calibrated, adjusted and operate properly. Sequences of operation have been functionally tested to ensure they operate in accordance with approved plans and specifications. ☐ **Lighting Controls Functional Testing has been completed** (Section 1513.8) Lighting controls have been tested to ensure that control devices, components, equipment, and systems are calibrated, adjusted and operate in accordance with approved plans and specifications.
Supporting Documents (Section 1416.3.4)	☐ **Systems documentation, record documents and training have been completed or are scheduled.** • System documentation has been provided to the owner or scheduled date: ___ • Record documents have been submitted to owner or scheduled date: _____ • Training has been completed or scheduled date: _____
Commissioning Report (Section 1416.3.5)	☐ **Commissioning Report submitted to Owner and includes items below.** • Completed Functional Tests documentation.

Project Information	**Project Name:**	
	Project Address:	
	Commissioning Authority:	
	•	Deficiencies found during testing required by this section which have not been corrected at the time of report preparation and the anticipated date of correction.
	•	Deferred tests, which cannot be performed at the time of report preparation due to climatic conditions or other circumstances beyond control of Commissioning Authority.
Certification	☐	I hereby certify that all requirements for commissioning have been completed in accordance with the Washington State Energy Code, including all items above. _____ Building Owner or Owner's Representative Date

[Statutory Authority: RCW 19.27A.025, 19.27A.045. 10-22-057, § 51-11-1416, filed 10/28/10, effective 1/1/11; 10-03-115, 10-13-113 and 10-22-056, § 51-11-1416, filed 1/20/10, 6/21/10 and 10/28/10, effective 1/1/11. Statutory Authority: RCW 19.27A.022, 19.27A.025, 19.27A.045, and chapters 19.27 and 34.05 RCW. 07-01-089, § 51-11-1416, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27A.025, 19.27A.045. 01-03-010, § 51-11-1416, filed 1/5/01, effective 7/1/01.]

Reviser's note: Notice of Objection: The Joint Administrative Rules Review Committee (Committee) finds that, in adopting the 2009 proposed changes to the State Energy Code, Chapter 51-11 WAC, on November 20, 2009, the State Building Code Council (Council) failed to comply with all requirements of the law and failed to adequately respond to the Committee's request for additional economic impact and cost-benefit analyses prior to adoption.

On October 1, 2009, the Committee found that the Small Business Economic Impact Statement (SBEIS) for the proposed changes filed with the Code Reviser failed to comply with all requirements of law. The Committee requested that the Council conduct a cost-benefit analysis pursuant to RCW 34.05.328 and amend the SBEIS to provide additional economic impact information, including an estimate of the number of jobs that would be created or lost as a result of compliance with all the proposed rules, as required by RCW 19.85.040 (2)(d).

The Council provided the Committee with information and data on November 18, 2009. On December 2, 2009, the Committee found that the Council failed to adequately respond to the Committee's request for additional data. Specifically, the Committee found that the Council failed to amend the SBEIS to (a) estimate the number of jobs that would be created or lost as a result of compliance with the proposed changes; and (b) support the SBEIS with a detailed and rigorous costs analysis of the cumulative impact of all the changes. In addition, the Committee found that the Council failed to provide the Committee with a cost-benefit analysis of the proposed changes and pursuant to the requirements of RCW 34.05.328.

The Committee strongly supports a process that makes thoughtful and informed progress towards changes that result in improved energy efficiency in our buildings, wherever practicable. While the Council worked diligently, it is the opinion of the Committee that the Council did not fully develop and consider the economic impacts and costs versus benefits of these significant changes to our Energy Code. Furthermore, it is the opinion of the Committee that the Council and the Legislature need this information to fully evaluate the value, impacts, and consequences of the proposed codes, with due diligence to their respective fiduciary responsibilities, in order to create the best informed public policy.

As a result, the Committee recommends that the Governor suspend the adoption and implementation of the changes to the Energy Code, Chapter 51-11 WAC, adopted by the Council on November 20, 2009, until such time as a more adequate analysis has been completed and considered by the appropriate bodies.

For all of the above stated reasons, the Committee objects to the changes to the State Energy Code, Chapter 51-11 WAC, that were adopted by the Council on November 20, 2009, and hereby directs the Code Reviser, pursuant to RCW 34.05.640(4), to publish this Notice of Objection in the Washington State Register and along with any publication in the Washington Administrative Code of changes to Chapter 51-11 WAC that were adopted by the Council in 2009 and filed with the Code Reviser.

WAC 51-11-1421 System type. To qualify as a simple system, systems shall have no active humidification or simultaneous heating and cooling and shall be one of the following:

a. Air cooled, constant volume packaged equipment, which provide heating, cooling or both, and require only external connection to duct work and energy services with cooling capacity of 135,000 Btu/h or less.
b. Air cooled, constant volume split systems, which provide heating, cooling or both, with cooling capacity of 84,000 Btu/h or less.
c. Heating only systems which have a capacity of less than 1,000 cfm or which have a minimum outside air supply of less than 30 percent of the total air circulation.

The combined airflow rate of all simple systems serving single rooms must be less than 10,000 cfm or they do not qualify as simple systems.

All other systems shall comply with Sections 1430 through 1438.

1421.1 System Sizing Limits: Installed space heating equipment output shall not exceed 10 Btu/h per square foot of gross conditioned floor area and installed space cooling equipment output shall not exceed 15 Btu/h per square foot of gross conditioned floor area. No additional safety factor is allowed.

EXCEPTIONS: 1. For equipment which provides both heating and cooling in one package unit, compliance need only be demonstrated for either the space heating or space cooling system size.
2. Equipment sized in accordance with Section 1431.2.

[Statutory Authority: RCW 19.27A.025, 19.27A.045. 10-03-115, 10-13-113 and 10-22-056, § 51-11-1421, filed 1/20/10, 6/21/10 and 10/28/10, effective 1/1/11; 98-03-003, § 51-11-1421, filed 1/8/98, effective 7/1/98. Statutory Authority: RCW 19.27A.025. 93-21-052, § 51-11-1421, filed 10/18/93, effective 4/1/94.]

Reviser's note: Notice of Objection: The Joint Administrative Rules Review Committee (Committee) finds that, in adopting the 2009 proposed changes to the State Energy Code, Chapter 51-11 WAC, on November 20, 2009, the State Building Code Council (Council) failed to comply with all requirements of the law and failed to adequately respond to the Committee's request for additional economic impact and cost-benefit analyses prior to adoption.

On October 1, 2009, the Committee found that the Small Business Economic Impact Statement (SBEIS) for the proposed changes filed with the Code Reviser failed to comply with all requirements of law. The Committee requested that the Council conduct a cost-benefit analysis pursuant to RCW 34.05.328 and amend the SBEIS to provide additional economic impact information, including an estimate of the number of jobs that would be created or lost as a result of compliance with all the proposed rules, as required by RCW 19.85.040 (2)(d).

The Council provided the Committee with information and data on November 18, 2009. On December 2, 2009, the Committee found that the Council failed to adequately respond to the Committee's request for additional data. Specifically, the Committee found that the Council failed to amend the SBEIS to (a) estimate the number of jobs that would be created or lost as a result of compliance with the proposed changes; and (b) support the

SBEIS with a detailed and rigorous costs analysis of the cumulative impact of all the changes. In addition, the Committee found that the Council failed to provide the Committee with a cost-benefit analysis of the proposed changes and pursuant to the requirements of RCW 34.05.328.

The Committee strongly supports a process that makes thoughtful and informed progress towards changes that result in improved energy efficiency in our buildings, wherever practicable. While the Council worked diligently, it is the opinion of the Committee that the Council did not fully develop and consider the economic impacts and costs versus benefits of these significant changes to our Energy Code. Furthermore, it is the opinion of the Committee that the Council and the Legislature need this information to fully evaluate the value, impacts, and consequences of the proposed codes, with due diligence to their respective fiduciary responsibilities, in order to create the best informed public policy.

As a result, the Committee recommends that the Governor suspend the adoption and implementation of the changes to the Energy Code, Chapter 51-11 WAC, adopted by the Council on November 20, 2009, until such time as a more adequate analysis has been completed and considered by the appropriate bodies.

For all of the above stated reasons, the Committee objects to the changes to the State Energy Code, Chapter 51-11 WAC, that were adopted by the Council on November 20, 2009, and hereby directs the Code Reviser, pursuant to RCW 34.05.640(4), to publish this Notice of Objection in the Washington State Register and along with any publication in the Washington Administrative Code of changes to Chapter 51-11 WAC that were adopted by the Council in 2009 and filed with the Code Reviser.

WAC 51-11-1423 Economizers. Air economizers meeting the requirements of Section 1413 shall be provided on all new systems including those serving computer server rooms, electronic equipment, radio equipment, and telephone switchgear.

EXCEPTION: Equipment complying with one of the exceptions to Section 1433.

[Statutory Authority: RCW 19.27A.025, 19.27A.045. 10-03-115, 10-13-113 and 10-22-056, § 51-11-1423, filed 1/20/10, 6/21/10 and 10/28/10, effective 1/1/11. Statutory Authority: RCW 19.27A.025, 19.27A.045, and chapters 19.27, 19.27A and 34.05 RCW. 05-23-103, § 51-11-1423, filed 11/17/05, effective 7/1/06; 05-01-013, § 51-11-1423, filed 12/2/04, effective 7/1/05. Statutory Authority: RCW 19.27A.025, 19.27A.045. 02-01-112, § 51-11-1423, filed 12/18/01, effective 7/1/02; 01-03-010, § 51-11-1423, filed 1/5/01, effective 7/1/01; 98-03-003, § 51-11-1423, filed 1/8/98, effective 7/1/98. Statutory Authority: RCW 19.27A.025. 93-21-052, § 51-11-1423, filed 10/18/93, effective 4/1/94.]

Reviser's note: Notice of Objection: The Joint Administrative Rules Review Committee (Committee) finds that, in adopting the 2009 proposed changes to the State Energy Code, Chapter 51-11 WAC, on November 20, 2009, the State Building Code Council (Council) failed to comply with all requirements of the law and failed to adequately respond to the Committee's request for additional economic impact and cost-benefit analyses prior to adoption.

On October 1, 2009, the Committee found that the Small Business Economic Impact Statement (SBEIS) for the proposed changes filed with the Code Reviser failed to comply with all requirements of law. The Committee requested that the Council conduct a cost-benefit analysis pursuant to RCW 34.05.328 and amend the SBEIS to provide additional economic impact information, including an estimate of the number of jobs that would be created or lost as a result of compliance with all the proposed rules, as required by RCW 19.85.040 (2)(d).

The Council provided the Committee with information and data on November 18, 2009. On December 2, 2009, the Committee found that the Council failed to adequately respond to the Committee's request for additional data. Specifically, the Committee found that the Council failed to amend the SBEIS to (a) estimate the number of jobs that would be created or lost as a result of compliance with the proposed changes; and (b) support the SBEIS with a detailed and rigorous costs analysis of the cumulative impact of all the changes. In addition, the Committee found that the Council failed to provide the Committee with a cost-benefit analysis of the proposed changes and pursuant to the requirements of RCW 34.05.328.

The Committee strongly supports a process that makes thoughtful and informed progress towards changes that result in improved energy efficiency in our buildings, wherever practicable. While the Council worked diligently, it is the opinion of the Committee that the Council did not fully develop and consider the economic impacts and costs versus benefits of these significant changes to our Energy Code. Furthermore, it is the opinion of the Committee that the Council and the Legislature need this information to fully evaluate the value, impacts, and consequences of the proposed codes, with due diligence to their respective fiduciary responsibilities, in order to create the best informed public policy.

As a result, the Committee recommends that the Governor suspend the adoption and implementation of the changes to the Energy Code, Chapter 51-11 WAC, adopted by the Council on November 20, 2009, until such time as a more adequate analysis has been completed and considered by the appropriate bodies.

For all of the above stated reasons, the Committee objects to the changes to the State Energy Code, Chapter 51-11 WAC, that were adopted by the Council on November 20, 2009, and hereby directs the Code Reviser, pursuant to RCW 34.05.640(4), to publish this Notice of Objection in the Washington State Register and along with any publication in the Washington Administrative Code of changes to Chapter 51-11 WAC that were adopted by the Council in 2009 and filed with the Code Reviser.

WAC 51-11-1431 System type. All systems not qualifying for Sections 1420 through 1424 (Simple Systems), including field fabricated and constructed of system components, shall comply with Sections 1430 through 1438. Simple systems may also comply with Sections 1430 through 1438.

1431.1 Field-Assembled Equipment and Components: Field-assembled equipment and components from more than one manufacturer shall show compliance with this section and Section 1411 through calculations of total on-site energy input and output. The combined component efficiencies as measured per Section 1411.2, shall be in compliance with the requirements of Section 1411.1.

Total on-site energy input to the equipment shall be determined by combining the energy inputs to all components, elements, and accessories such as compressor(s), internal circulating pump(s), purge devices, viscosity control heaters, and controls.

1431.2 System Sizing Limits: Heating and cooling design loads for the purpose of sizing systems shall be determined in accordance with one of the procedures described in Chapter 29 of Standard RS-1 listed in Chapter 7 or an equivalent computation procedure. For interior temperatures, 70°F shall be used for heating and 75°F for cooling, except where different values are specified in the Washington Administrative Code (WAC).

Building mechanical systems for all buildings which provide space heating and/or space cooling shall be sized no greater than 150 percent of the design load as calculated above, except that cooling towers shall comply with the sizing requirements in Section 1411.1. No additional safety factor is allowed.

For buildings with a total equipment cooling capacity of 300 tons and above, the equipment shall comply with one of the following:

1. No one unit shall have a cooling capacity of more than 2/3 of the total installed cooling equipment capacity;
2. The equipment shall have a variable speed drive; or
3. The equipment shall have multiple compressors.

EXCEPTIONS: The following limited exemptions from the sizing limit shall be allowed, however, in all cases heating and/or cooling design load calculations shall be submitted.

1. For a single piece of equipment which has both heating and cooling capability, only one function, either the heating or the cooling, need meet the

requirements of this section. Capacity for the other function shall be, within available equipment options, the smallest size necessary to meet the load.

2. Stand-by equipment may be installed if controls and devices are provided which allow redundant equipment to operate automatically only when the primary equipment is not operating.

3. Multiple units of the same equipment type, such as multiple chillers and boilers, with combined capacities exceeding the design load, or a single unit that is capable of modulating to a part-load capacity of 50 percent of the load or less, may be specified to operate concurrently only if controls are provided that sequence or otherwise optimally control the operation of each unit based on load.

4. Installed space heating equipment output that does not exceed 10 Btu/h per square foot of gross conditioned floor area and installed space cooling equipment output that does not exceed 15 Btu/h per square foot of gross conditioned floor area. No additional safety factor is allowed.

[Statutory Authority: RCW 19.27A.025, 19.27A.045. 10-03-115, 10-13-113 and 10-22-056, § 51-11-1431, filed 1/20/10, 6/21/10 and 10/28/10, effective 1/1/11. Statutory Authority: RCW 19.27A.025. 93-21-052, § 51-11-1431, filed 10/18/93, effective 4/1/94.]

Reviser's note: Notice of Objection: The Joint Administrative Rules Review Committee (Committee) finds that, in adopting the 2009 proposed changes to the State Energy Code, Chapter 51-11 WAC, on November 20, 2009, the State Building Code Council (Council) failed to comply with all requirements of the law and failed to adequately respond to the Committee's request for additional economic impact and cost-benefit analyses prior to adoption.

On October 1, 2009, the Committee found that the Small Business Economic Impact Statement (SBEIS) for the proposed changes filed with the Code Reviser failed to comply with all requirements of law. The Committee requested that the Council conduct a cost-benefit analysis pursuant to RCW 34.05.328 and amend the SBEIS to provide additional economic impact information, including an estimate of the number of jobs that would be created or lost as a result of compliance with all the proposed rules, as required by RCW 19.85.040 (2)(d).

The Council provided the Committee with information and data on November 18, 2009. On December 2, 2009, the Committee found that the Council failed to adequately respond to the Committee's request for additional data. Specifically, the Committee found that the Council failed to amend the SBEIS to (a) estimate the number of jobs that would be created or lost as a result of compliance with the proposed changes; and (b) support the SBEIS with a detailed and rigorous costs analysis of the cumulative impact of all the changes. In addition, the Committee found that the Council failed to provide the Committee with a cost-benefit analysis of the proposed changes and pursuant to the requirements of RCW 34.05.328.

The Committee strongly supports a process that makes thoughtful and informed progress towards changes that result in improved energy efficiency in our buildings, wherever practicable. While the Council worked diligently, it is the opinion of the Committee that the Council did not fully develop and consider the economic impacts and costs versus benefits of these significant changes to our Energy Code. Furthermore, it is the opinion of the Committee that the Council and the Legislature need this information to fully evaluate the value, impacts, and consequences of the proposed codes, with due diligence to their respective fiduciary responsibilities, in order to create the best informed public policy.

As a result, the Committee recommends that the Governor suspend the adoption and implementation of the changes to the Energy Code, Chapter 51-11 WAC, adopted by the Council on November 20, 2009, until such time as a more adequate analysis has been completed and considered by the appropriate bodies.

For all of the above stated reasons, the Committee objects to the changes to the State Energy Code, Chapter 51-11 WAC, that were adopted by the Council on November 20, 2009, and hereby directs the Code Reviser, pursuant to RCW 34.05.640(4), to publish this Notice of Objection in the Washington State Register and along with any publication in the Washington Administrative Code of changes to Chapter 51-11 WAC that were adopted by the Council in 2009 and filed with the Code Reviser.

WAC 51-11-1432 Controls.

1432.1 Setback and Shutoff: Systems that serve zones with different uses, as defined in Table 15-1.

1. Shall be served by separate systems, or

2. Shall include isolation devices and controls to shut off or set back the supply of heating and cooling to each zone independently.

EXCEPTION: Isolation or separate systems are not required for zones expected to operate continuously or expected to be inoperative only when all other zones are inoperative.

1432.2 Systems Temperature Reset Controls

1432.2.1 Air Systems for Multiple Zones: Systems supplying heated or cooled air to multiple zones shall include controls which automatically reset supply air temperatures by representative building loads. Temperature shall be reset by at least 25 percent of the design supply-air-to-room-air temperature difference. Interior zones without an exterior wall load impact and high occupancy areas (per Section 1412.8) shall have maximum airflow sized to meet typical cooling loads with the higher reset air temperature.

EXCEPTIONS:
1. Where specified humidity levels are required to satisfy process needs, such as computer rooms or museums.
2. Systems that prevent reheating, recooling, or mixing of heated and cooled air supply.
3. 75 percent of the energy for reheating is from site-recovered or site solar energy sources.
4. Zones with peak supply air quantities of 300 cfm or less.
5. Dedicated outdoor air systems less than 5,000 cfm with separate thermal controls.

1432.2.2 Hydronic Systems: Systems with a design capacity of 300,000 Btu/h or greater supplying heated or mechanically refrigerated water shall include controls which automatically reset supply water temperatures by representative building loads or by outside air temperature. Temperature shall be reset by at least 25 percent of the design supply-to-return water temperature differences.

EXCEPTIONS:
1. Steam boilers.
2. Systems that provide heating with 100°F or lower supply temperature (e.g., water source heat pump loops).

To limit the heat loss from the heat rejection device (cooling tower), for hydronic heat pumps connected to a common heat pump water loop with central devices for heat rejection (e.g., cooling tower):

a. If a closed-circuit tower (fluid cooler) is used, either an automatic valve shall be installed to bypass all but a minimal flow of water around the tower (for freeze protection), or low leakage positive closure dampers shall be provided.

b. If an open-circuit tower is used directly in the heat pump loop, an automatic valve shall be installed to bypass all heat pump water flow around the tower.

c. If an open-circuit tower is used in conjunction with a separate heat exchanger to isolate the tower from the heat pump loop, then heat loss shall be controlled by shutting down the circulation pump on the cooling tower loop.

For hydronic heat pumps connected to a common heat pump water loop with central devices for heat rejection (e.g., cooling tower) and having a total pump system power exceeding 10 hp, each hydronic heat pump shall have:

a. A two-position two-way (but not three-way) valve, or

b. A variable head pressure two-way (water regulating) control valve or pump.

For the purposes of this section, pump system power is the sum of the nominal power demand (i.e., nameplate horsepower at nominal motor efficiency) of motors of all pumps that are required to operate at design conditions to supply fluid from the heating or cooling source to all heat transfer devices (e.g., coils, heat exchanger) and return it to the source. This converts the system into a variable flow system and, as such, the primary circulation pumps shall comply with the variable flow requirements in Section 1438.

1432.3 Hydronic System Valves and Piping.

1432.3.1 Hydronic Flow Criteria: HVAC chilled water, condenser water, and hot water pumping shall be designed for variable fluid flow and shall be capable of reducing pump flow rates to no more than the larger of 50 percent or less of the design flow rate, or the minimum flow required by the equipment manufacturer for proper operation of equipment served by the system.

EXCEPTIONS:
1. Heating, chilled, and heat pump water systems that include three or fewer control valves and have a total pump system power less than or equal to 3 hp (2.2 kW).
2. Systems having a total pump system power less than or equal to 1-1/2 hp (1.1 kW).
3. Condenser water systems for chillers.

1432.3.1.1 Variable Flow controls: Individual pumps requiring variable speed control per Section 1438 shall be controlled in one of the following manners:

1. For systems having a combined pump motor horsepower less than or equal to 20 hp (15 kW) and without direct digital control of individual coils, pump speed shall be a function of either:

a. Required differential pressure; or

b. Reset directly based on zone hydronic demand, or other zone load indicators; or

c. Reset directly based on pump power and pump differential pressure.

2. For systems having a combined pump motor horsepower that exceeds 20 hp (15 kW) or smaller systems with direct digital control, pump speed shall be a function of either:

a. The static pressure set point as reset based on the valve requiring the most pressure; or

b. Directly controlled based on zone hydronic demand.

1432.3.2 Heat Rejection Device Isolation: To limit the heat loss from the heat rejection device (cooling tower), for hydronic heat pumps connected to a common heat pump water loop with central devices for heat rejection (e.g., cooling tower):

a. If a closed-circuit tower (fluid cooler) is used, either an automatic valve shall be installed to bypass all but a minimal flow of water around the tower (for freeze protection), or low leakage positive closure dampers shall be provided.

b. If an open-circuit tower is used directly in the heat pump loop, an automatic valve shall be installed to bypass all heat pump water flow around the tower.

c. If an open-circuit tower is used in conjunction with a separate heat exchanger to isolate the tower from the heat pump loop, then heat loss shall be controlled by shutting down the circulation pump on the cooling tower loop.

1432.3.3 Hydronic Heat Pump Isolation: For hydronic heat pumps connected to a common heat pump water loop with central devices for heat rejection (e.g., cooling tower) and having a total pump system power exceeding 10 hp, each hydronic heat pump shall have:

a. A two-position two-way (but not three-way) valve; or

b. A variable head pressure two-way (water regulating) control valve or pump.

For the purposes of this section, pump system power is the sum of the nominal power demand (i.e., nameplate horsepower at nominal motor efficiency) of motors of all pumps that are required to operate at design conditions to supply fluid from the heating or cooling source to all heat transfer devices (e.g., coils, heat exchanger) and return it to the source. This converts the system into a variable flow system and, as such, the primary circulation pumps shall comply with the variable flow requirements in Section 1438.

1432.3.4 Chiller Isolation: When a chilled water plant includes more than one chiller, provisions shall be made so that flow through any chiller is automatically shut off when that chiller is shut off while still maintaining flow through other operating chiller(s). Chillers that are piped in series for the purpose of increased temperature differential shall be considered as one chiller.

EXCEPTION: Chillers that are piped in series for the purpose of increased temperature differential.

1432.3.5 Boiler Isolation: When a hot water plant includes more than one boiler, provisions shall be made so that flow through any boiler is automatically shut off when that boiler is shut off while still maintaining flow through other operating boiler(s).

1432.4 Direct Digital Control System Capabilities: All complex systems equipped with direct digital control (DDC) systems and all buildings with total cooling capacity exceeding 780,000 Btu/hr (2,662 kW) shall have the following capability:

a. Trending: All control system input and output points shall be accessible and programmed for trending, and a graphic trending package shall be provided with the control system.

b. Demand Response Setpoint Adjustment: Control logic shall increase the cooling zone set points by at least 2°F (1°C) and reduce the heating zone set points by at least 2°F (1°C) when activated by a demand response signal. The demand response signal shall be a binary input to the control system or other interface approved by the serving electric utility.

1432.5 Variable Air Volume System Static Pressure Reset Controls: The static pressure set point shall be reset to the lowest point possible while still providing the required air flow to the zones with the greatest demand.

EXCEPTION: Systems where fan speed is reset directly based on zone airflows or other zone load indicators.

[Statutory Authority: RCW 19.27A.025, 19.27A.045. 10-03-115, 10-13-113 and 10-22-056, § 51-11-1432, filed 1/20/10, 6/21/10 and 10/28/10, effective 1/1/11. Statutory Authority: RCW 19.27A.022, 19.27A.025, 19.27A.045,

and chapters 19.27 and 34.05 RCW. 07-01-089, § 51-11-1432, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27A.025. 93-21-052, § 51-11-1432, filed 10/18/93, effective 4/1/94.]

Reviser's note: Notice of Objection: The Joint Administrative Rules Review Committee (Committee) finds that, in adopting the 2009 proposed changes to the State Energy Code, Chapter 51-11 WAC, on November 20, 2009, the State Building Code Council (Council) failed to comply with all requirements of the law and failed to adequately respond to the Committee's request for additional economic impact and cost-benefit analyses prior to adoption.

On October 1, 2009, the Committee found that the Small Business Economic Impact Statement (SBEIS) for the proposed changes filed with the Code Reviser failed to comply with all requirements of law. The Committee requested that the Council conduct a cost-benefit analysis pursuant to RCW 34.05.328 and amend the SBEIS to provide additional economic impact information, including an estimate of the number of jobs that would be created or lost as a result of compliance with all the proposed rules, as required by RCW 19.85.040 (2)(d).

The Council provided the Committee with information and data on November 18, 2009. On December 2, 2009, the Committee found that the Council failed to adequately respond to the Committee's request for additional data. Specifically, the Committee found that the Council failed to amend the SBEIS to (a) estimate the number of jobs that would be created or lost as a result of compliance with the proposed changes; and (b) support the SBEIS with a detailed and rigorous costs analysis of the cumulative impact of all the changes. In addition, the Committee found that the Council failed to provide the Committee with a cost-benefit analysis of the proposed changes and pursuant to the requirements of RCW 34.05.328.

The Committee strongly supports a process that makes thoughtful and informed progress towards changes that result in improved energy efficiency in our buildings, wherever practicable. While the Council worked diligently, it is the opinion of the Committee that the Council did not fully develop and consider the economic impacts and costs versus benefits of these significant changes to our Energy Code. Furthermore, it is the opinion of the Committee that the Council and the Legislature need this information to fully evaluate the value, impacts, and consequences of the proposed codes, with due diligence to their respective fiduciary responsibilities, in order to create the best informed public policy.

As a result, the Committee recommends that the Governor suspend the adoption and implementation of the changes to the Energy Code, Chapter 51-11 WAC, adopted by the Council on November 20, 2009, until such time as a more adequate analysis has been completed and considered by the appropriate bodies.

For all of the above stated reasons, the Committee objects to the changes to the State Energy Code, Chapter 51-11 WAC, that were adopted by the Council on November 20, 2009, and hereby directs the Code Reviser, pursuant to RCW 34.05.640(4), to publish this Notice of Objection in the Washington State Register and along with any publication in the Washington Administrative Code of changes to Chapter 51-11 WAC that were adopted by the Council in 2009 and filed with the Code Reviser.

WAC 51-11-1433 Economizers. Air economizers meeting the requirements of Section 1413 shall be provided on all new systems including those serving computer server rooms, electronic equipment, radio equipment, telephone switchgear.

EXCEPTIONS:

1. Qualifying small equipment: This exception shall not be used for unitary cooling equipment installed outdoors or in a mechanical room adjacent to the outdoors. This exception is allowed to be used for other cooling units and split systems with a total cooling capacity rated in accordance with Section 1411.2 of less than 33,000 Btu/h (hereafter referred to as qualifying small systems) provided that these are high-efficiency cooling equipment with SEER and EER values more than 15% higher than minimum efficiencies listed in Tables 14-1A, 14-1B and 14-1D, in the appropriate size category, using the same test procedures. Equipment shall be listed in the appropriate certification program to qualify for this exception. The total capacity of all qualifying small equipment without economizers shall not exceed 72,000 Btu/h per building, or 5% of its air economizer capacity, whichever is greater. That portion of the equipment serving Group R Occupancy is not included in determining the total capacity of all units without economizers in a building. Redundant units are not counted in the capacity limitations. This exception shall not be used for the shell-and-core permit or for the initial tenant improvement or for RS-29 analysis.

2. Chilled water terminal units connected to systems with chilled water generation equipment with IPLV values more than 25% higher than minimum part load efficiencies listed in Table 14-1C, in the appropriate size category, using the same test procedures. Equipment shall be listed in the appropriate certification program to qualify for this exception. The total capacity of all systems without economizers shall not exceed 480,000 Btu/h per building, or 20% of its air economizer capacity, whichever is greater. That portion of the equipment serving Group R Occupancy is not included in determining the total capacity of all units without economizers in a building. This exception shall not be used for the shell-and-core permit or for the initial tenant improvement or for RS-29 analysis.

3. Water-cooled refrigeration equipment serving chilled beams and chilled ceilings space cooling systems only which are provided with a water economizer meeting the requirements of Section 1413. Water economizer capacity per building shall not exceed 500 tons. This exception shall not be used for RS-29 analysis.

4. Systems for which at least 75% of the annual energy used for mechanical cooling is provided from site-recovery or site-solar energy source.

5. Systems where special outside air filtration and treatment, for the reduction and treatment of unusual outdoor contaminants, makes an air economizer infeasible.

6. Systems with dehumidification that affect other systems so as to increase the overall building energy consumption. New humidification equipment shall comply with Section 1413.4.

7. Systems complying with all of the following criteria:

a. Consist of multiple water source heat pumps connected to a common water loop;

b. Have a minimum of 60% air economizer;

c. Have water source heat pumps with an EER at least 15% higher for cooling and a COP at least 15% higher for heating than that specified in Section 1411;

d. Where provided, have a central boiler or furnace efficiency of 90 percent minimum; and

e. Provide heat recovery with a minimum 50% heat recovery effectiveness as defined in Section 1436 to preheat the outside air supply.

8. For Group R Occupancy, cooling units installed outdoors or in a mechanical room adjacent to outdoors with a total cooling capacity less than 20,000 Btu/h and other cooling units with a total cooling capacity less than 54,000 Btu/h provided that these are high-efficiency cooling equipment with SEER and EER values more than 15 percent higher than minimum efficiencies listed in Tables 14-1A, 14-1B and 14-1D, in the appropriate size category, using the same test procedures. Equipment shall be listed in the appropriate certification program to qualify for this exception. For split-systems, compliance is based on the cooling capacity of individual fan coil units.

9. Equipment used to cool any dedicated server room, electronic equipment room or telecom switch room provided that they completely comply with option 9a, 9b, or 9c in the table below. The total capacity of all systems without economizers shall not exceed 240,000 Btu/h per building or 10 percent of its air economizer capacity, whichever is greater. This exception shall not be used for RS-29 analysis.

10. Variable refrigerant flow (VRF) systems, multiple-zone split-system heat pumps, consisting of multiple, individually metered indoor units with multi-speed fan motors, served on a single common refrigeration circuit with an exterior reverse-cycle heat pump with variable speed compressor(s) and variable speed condenser fan(s). These systems shall also be capable of providing simultaneous heating and cooling operation, where recovered energy from the indoor units operating in one mode can be transferred to one or more indoor units operating in the other mode, and shall serve at least 20 percent internal (no perimeter wall within 12') and 20 percent perimeter zones (as determined by conditioned floor area) and the outdoor unit shall be at least 65,000 Btu/h in total capacity. Systems utilizing this exception shall have 50 percent heat recovery effectiveness on the

outside air. For the purposes of this exception, dedicated server rooms, electronic equipment rooms or telecom switch rooms are not considered perimeter zones. This exception shall be limited to buildings of 60,000 square feet and less.

	Equipment Type	Higher Equipment Efficiency	Part-Load Control	Economizer
Option 9a	Table 14-1A and Table 14-1B[a]	+ 15%[b]	Required over 85,000 Btu/h[c]	None required
Option 9b	Table 14-1A and Table 14-1B[a]	+ 5%[d]	Required over 85,000 Btu/h[c]	Waterside economizer
Option 9c	ASHRAE Standard 127[f]	+ 0%[g]	Required over 85,000 Btu/h[c]	Waterside economizer

a. For a system where all of the cooling equipment is subject to the AHRI standards listed in Tables 14-1A and 14-1B, the system shall comply with all of the following (note that if the system contains any cooling equipment that exceeds the capacity limits in Table 14-1A or 14-1B, or if the system contains any cooling equipment that is not included in Table 14-1A or 14-1B, then the system is not allowed to use this option).

b. The cooling equipment shall have an EER value and an IPLV value that is a minimum of 15 percent greater than the value listed in Tables 14-1A and 14-1B (1.15 x values in Tables 14-1A and 14-1B).

c. For units with a total cooling capacity over 85,000 Btu/h, the system shall utilize part-load capacity control schemes that are able to modulate to a part-load capacity of 50 percent of the load or less that results in the compressor operating at the same or higher EER at part loads than at full load (e.g., minimum of two-stages of compressor unloading such as cylinder unloading, two-stage scrolls, dual tandem scrolls, but hot gas bypass is not credited as a compressor unloading system).

d. The cooling equipment shall have an EER value and an IPLV value that is a minimum of 5 percent greater than the value listed in Tables 14-1A and 14-1B (1.05 x values in Tables 14-1A and 14-1B).

e. The system shall include a water economizer in lieu of air economizer. Water economizers shall be capable of providing the total concurrent cooling load served by the connected terminal equipment lacking airside economizer, at outside air temperatures of 50°F dry-bulb/45°F wet-bulb and below. For this calculation, all factors including solar and internal load shall be the same as those used for peak load calculations, except for the outside temperatures. The equipment shall be served by a dedicated condenser water system unless a nondedicated condenser water system exists that can provide appropriate water temperatures during hours when waterside economizer cooling is available.

f. For a system where all cooling equipment is subject to ASHRAE Standard 127-2007.

g. The cooling equipment subject to the ASHRAE Standard 127-2007 shall have an EER value and an IPLV value that is equal or greater than the value listed in Tables 14-1A and 14-1B when determined in accordance with the rating conditions ASHRAE Standard 127-2007 (i.e., not the rating conditions in AHRI Standard 210/240 or 340/360). This information shall be provided by an independent third party.

[Statutory Authority: RCW 19.27A.025, 19.27A.045. 10-03-115, 10-13-113 and 10-22-056, § 51-11-1433, filed 1/20/10, 6/21/10 and 10/28/10, effective 1/1/11. Statutory Authority: RCW 19.27A.022, 19.27A.025, 19.27A.045, and chapters 19.27 and 34.05 RCW. 07-01-089, § 51-11-1433, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27A.025, 19.27A.045 and chapters 19.27, 19.27A, and 34.05 RCW. 05-01-013, § 51-11-1433, filed 12/2/04, effective 7/1/05. Statutory Authority: RCW 19.27A.025, 19.27A.045. 02-01-112, § 51-11-1433, filed 12/18/01, effective 7/1/02; 01-03-010, § 51-11-1433, filed 1/5/01, effective 7/1/01; 98-03-003, § 51-11-1433, filed 1/8/98, effective 7/1/98. Statutory Authority: RCW 19.27A.025. 93-21-052, § 51-11-1433, filed 10/18/93, effective 4/1/94.]

Reviser's note: Notice of Objection: The Joint Administrative Rules Review Committee (Committee) finds that, in adopting the 2009 proposed changes to the State Energy Code, Chapter 51-11 WAC, on November 20, 2009, the State Building Code Council (Council) failed to comply with all requirements of the law and failed to adequately respond to the Committee's request for additional economic impact and cost-benefit analyses prior to adoption.

On October 1, 2009, the Committee found that the Small Business Economic Impact Statement (SBEIS) for the proposed changes filed with the Code Reviser failed to comply with all requirements of law. The Committee requested that the Council conduct a cost-benefit analysis pursuant to RCW 34.05.328 and amend the SBEIS to provide additional economic impact information, including an estimate of the number of jobs that would be created or lost as a result of compliance with all the proposed rules, as required by RCW 19.85.040 (2)(d).

The Council provided the Committee with information and data on November 18, 2009. On December 2, 2009, the Committee found that the Council failed to adequately respond to the Committee's request for additional data. Specifically, the Committee found that the Council failed to amend the SBEIS to (a) estimate the number of jobs that would be created or lost as a result of compliance with the proposed changes; and (b) support the SBEIS with a detailed and rigorous costs analysis of the cumulative impact of all the changes. In addition, the Committee found that the Council failed to provide the Committee with a cost-benefit analysis of the proposed changes and pursuant to the requirements of RCW 34.05.328.

The Committee strongly supports a process that makes thoughtful and informed progress towards changes that result in improved energy efficiency in our buildings, wherever practicable. While the Council worked diligently, it is the opinion of the Committee that the Council did not fully develop and consider the economic impacts and costs versus benefits of these significant changes to our Energy Code. Furthermore, it is the opinion of the Committee that the Council and the Legislature need this information to fully evaluate the value, impacts, and consequences of the proposed codes, with due diligence to their respective fiduciary responsibilities, in order to create the best informed public policy.

As a result, the Committee recommends that the Governor suspend the adoption and implementation of the changes to the Energy Code, Chapter 51-11 WAC, adopted by the Council on November 20, 2009, until such time as a more adequate analysis has been completed and considered by the appropriate bodies.

For all of the above stated reasons, the Committee objects to the changes to the State Energy Code, Chapter 51-11 WAC, that were adopted by the Council on November 20, 2009, and hereby directs the Code Reviser, pursuant to RCW 34.05.640(4), to publish this Notice of Objection in the Washington State Register and along with any publication in the Washington Administrative Code of changes to Chapter 51-11 WAC that were adopted by the Council in 2009 and filed with the Code Reviser.

WAC 51-11-1435 Simultaneous heating and cooling.

Systems which provide heating and cooling simultaneously to a zone are prohibited. Zone thermostatic and humidistatic controls shall be capable of operating in sequence the supply of heating and cooling energy to the zone. Such controls shall prevent:

a. Reheating for temperature control.
b. Recooling for temperature control.
c. Mixing or simultaneous supply of air that has been previously mechanically heated and air that has been previously cooled, either by economizer systems, groundwater, or by mechanical refrigeration.
d. Other simultaneous operation of heating and cooling systems to the same zone.
e. Reheating for humidity control.

EXCEPTIONS: 1. Variable air volume (VAV) systems which, during periods of occupancy are designed and controlled:
1.1 To reduce the primary air supply to each zone to a minimum air volume when the zone temperature is in a 5°F (3°C) zone temperature dead band after cooling is no longer required and before reheating, recooling or mixing takes place. This minimum volume shall be no greater than the larger of the following:
1.1.1 Twenty percent of the peak supply volume; or
1.1.2 The volume of outdoor air required to meet zone ventilation requirements, unless increasing the volume to critical zones (zones with the highest ratio of outside air to total supply air) beyond the minimum ventilation requirements results in a decrease in overall outside air required by the HVAC system. An increase beyond minimum ventilation rates shall not be applied to more than 20 percent of the zones with reheat on any one system excluding zones equipped

with ventilation controls for high occupancy areas required by Section 1317.2.2.
1.2 So the volume of air that is reheated, recooled, or mixed in peak heating demand shall be less than 50 percent of the zone design peak supply rate.
1.3 So the airflow between dead band and full heating or full cooling shall be modulated.
1.4 So the control logic of each system shall have means preventing changes in setpoint(s) from inducting simultaneous heating and cooling (including economizer cooling) except for humidity control or zone controls operating as described under exception 1.1.
2. Zones where special pressurization relationships, cross-contamination requirements, or code-required minimum circulation rates are such that variable air volume systems are impractical, such as some areas of hospitals and laboratories. Systems which use this exception and supply heated or cooled air to multiple zones shall include:
2.1 Controls that automatically reset supply air temperatures by representative building loads or by outside air temperature unless it can be shown that supply air temperature reset increases overall building annual energy costs.
2.2 Variable speed drives for supply and return fans, zone dampers on all zones, specified occupied and unoccupied or low occupancy airflows, and have controls which reduce airflow in response to changes in occupancy levels.
3. Zones where at least 75% of the energy for reheating or for providing warm air in mixing systems is provided from a site-recovered (including condenser heat) or site solar energy source.
4. Zones where specific humidity levels are required to satisfy process needs, such as computer rooms, museums, surgical suites, and buildings with refrigerating systems, such as supermarkets, refrigerated warehouses, and ice arenas.
5. Zones with a peak supply air quantity of 300 cfm (142 L/s) or less.
6. Three deck multizone systems that mix economizer-cooled (mixed) air with heated or cooled air where the temperature of the economizer-cooled air is reset based on weighted zone heating and cooling loads and zone airflow is reduced to a minimum of 20% design airflow or the volume of outdoor air required to meet zone ventilation requirements before mixing is allowed.

[Statutory Authority: RCW 19.27A.025, 19.27A.045. 10-03-115, 10-13-113 and 10-22-056, § 51-11-1435, filed 1/20/10, 6/21/10 and 10-22-056, effective 1/1/11; 01-03-010, § 51-11-1435, filed 1/5/01, effective 7/1/01. Statutory Authority: RCW 19.27A.025. 93-21-052, § 51-11-1435, filed 10/18/93, effective 4/1/94.]

Reviser's note: Notice of Objection: The Joint Administrative Rules Review Committee (Committee) finds that, in adopting the 2009 proposed changes to the State Energy Code, Chapter 51-11 WAC, on November 20, 2009, the State Building Code Council (Council) failed to comply with all requirements of the law and failed to adequately respond to the Committee's request for additional economic impact and cost-benefit analyses prior to adoption.

On October 1, 2009, the Committee found that the Small Business Economic Impact Statement (SBEIS) for the proposed changes filed with the Code Reviser failed to comply with all requirements of law. The Committee requested that the Council conduct a cost-benefit analysis pursuant to RCW 34.05.328 and amend the SBEIS to provide additional economic impact information, including an estimate of the number of jobs that would be created or lost as a result of compliance with all the proposed rules, as required by RCW 19.85.040 (2)(d).

The Council provided the Committee with information and data on November 18, 2009. On December 2, 2009, the Committee found that the Council failed to adequately respond to the Committee's request for additional data. Specifically, the Committee found that the Council failed to amend the SBEIS to (a) estimate the number of jobs that would be created or lost as a result of compliance with the proposed changes; and (b) support the SBEIS with a detailed and rigorous costs analysis of the cumulative impact of all the changes. In addition, the Committee found that the Council failed to provide the Committee with a cost-benefit analysis of the proposed changes and pursuant to the requirements of RCW 34.05.328.

The Committee strongly supports a process that makes thoughtful and informed progress towards changes that result in improved energy efficiency in our buildings, wherever practicable. While the Council worked diligently, it is the opinion of the Committee that the Council did not fully develop and consider the economic impacts and costs versus benefits of these significant changes to our Energy Code. Furthermore, it is the opinion of the Committee that the Council and the Legislature need this information to fully evaluate the value, impacts, and consequences of the proposed codes, with due diligence to their respective fiduciary responsibilities, in order to create the best informed public policy.

As a result, the Committee recommends that the Governor suspend the adoption and implementation of the changes to the Energy Code, Chapter 51-11 WAC, adopted by the Council on November 20, 2009, until such time as a more adequate analysis has been completed and considered by the appropriate bodies.

For all of the above stated reasons, the Committee objects to the changes to the State Energy Code, Chapter 51-11 WAC, that were adopted by the Council on November 20, 2009, and hereby directs the Code Reviser, pursuant to RCW 34.05.640(4), to publish this Notice of Objection in the Washington State Register and along with any publication in the Washington Administrative Code of changes to Chapter 51-11 WAC that were adopted by the Council in 2009 and filed with the Code Reviser.

WAC 51-11-1436 Heat recovery.

1436.1 Fan Systems: Fan systems which have a minimum outdoor air capacity of 5,000 cfm or greater shall have a heat recovery system with at least 50 percent recovery effectiveness. Fifty percent heat recovery effectiveness shall mean an increase in the outside air supply temperature at design heating conditions of one half the difference between the outdoor design air temperature and 65 degrees F. Provision shall be made to bypass or control the heat recovery system to permit air economizer operation as required by Section 1433. Heat recovery energy may be provided from any site-recovered or site-solar source. Where a single room or space is supplied by multiple units, the aggregate ventilation (cfm) of those units shall be used in applying this requirement.

EXCEPTIONS: These exceptions only apply to the particular exhaust subsystems. The remaining cfm of the main supply system is subject to the energy recovery requirements.

1. Laboratory systems equipped with both variable air volume supply and variable air volume or two-speed exhaust fume hoods provided that an instruction label is placed on the face of the hood that provides the information in Exhibit 14-1.

Exhibit 14-1

INSTRUCTIONS TO OPERATOR

To be in compliance with the Energy Code, this fume hood is designed to operate as variable air volume (VAV) by adjusting the sash or controller. Maintain sash in the minimum position during use and close totally when the fume hood is not in use.

2. Systems serving spaces heated to less than 60 degrees F.
3. Systems which can be shown to use as much energy with the addition of heat recovery equipment as without it.
4. Systems exhausting toxic, flammable, paint exhaust or corrosive fumes making the installation of heat recovery equipment impractical.
5. Type I commercial kitchen hoods.
6. Systems that only provide cooling.
7. Cooling only air handling units or air conditioning units where the minimum outdoor air is less than 70 percent of total supply air.

1436.2 Condensate Systems: On-site steam heating systems shall have condensate water recovery. On-site includes a system that is located within or adjacent to one or more buildings within the boundary of a contiguous area or campus under one ownership and which serves one or more of those buildings.

Buildings using steam generated off-site with steam heating systems which do not have condensate water recovery shall have condensate water recovery.

1436.3 Heat Recovery for Service Water Heating: Condenser water heat recovery systems shall be installed for heating or preheating of service hot water provided all of the following are true:

a. The facility operates 24 hours a day.

b. The total installed heat rejection capacity of the water-cooled systems exceeds 1,500,000 Btu/h of heat rejection.

c. The capacity of service water heating equipment exceeds 250,000 Btu/h.

The required heat recovery system shall have the capacity to provide the smaller of:

a. 60 percent of the peak heat rejection load at design conditions; or

b. Preheat of the peak service hot water draw to 85°F; or

c. 50 percent of the service water heating load.

EXCEPTIONS:
1. Facilities that employ condenser heat recovery for space heating with a heat recovery design exceeding 30 percent of the peak water-cooled condenser load at design conditions.
2. Facilities that provide 60 percent of their service water heating from site solar or site recovered energy or from other sources.

1436.4 Condenser Heat Recovery: Facilities having food service, meat or deli departments and having 500,000 Btu/h or greater of remote refrigeration condensers shall have condenser waste heat recovery from freezers and coolers and shall use the waste heat for service water heating, space heating or for dehumidification reheat. Facilities having a gross conditioned floor area of 40,000 ft² or greater and 1,000,000 Btu/h or greater of remote refrigeration shall have condenser waste heat recovery from freezers and coolers and shall use the waste heat for service water heating, and either for space heating or for dehumidification reheat for maintaining low space humidity.

[Statutory Authority: RCW 19.27A.025, 19.27A.045. 10-03-115, 10-13-113 and 10-22-056, § 51-11-1436, filed 1/20/10, 6/21/10 and 10/28/10, effective 1/1/11. Statutory Authority: RCW 19.27A.025. 93-21-052, § 51-11-1436, filed 10/18/93, effective 4/1/94.]

Reviser's note: Notice of Objection: The Joint Administrative Rules Review Committee (Committee) finds that, in adopting the 2009 proposed changes to the State Energy Code, Chapter 51-11 WAC, on November 20, 2009, the State Building Code Council (Council) failed to comply with all requirements of the law and failed to adequately respond to the Committee's request for additional economic impact and cost-benefit analyses prior to adoption.

On October 1, 2009, the Committee found that the Small Business Economic Impact Statement (SBEIS) for the proposed changes filed with the Code Reviser failed to comply with all requirements of law. The Committee requested that the Council conduct a cost-benefit analysis pursuant to RCW 34.05.328 and amend the SBEIS to provide additional economic impact information, including an estimate of the number of jobs that would be created or lost as a result of compliance with all the proposed rules, as required by RCW 19.85.040 (2)(d).

The Council provided the Committee with information and data on November 18, 2009. On December 2, 2009, the Committee found that the Council failed to adequately respond to the Committee's request for additional data. Specifically, the Committee found that the Council failed to amend the SBEIS to (a) estimate the number of jobs that would be created or lost as a result of compliance with the proposed changes; and (b) support the SBEIS with a detailed and rigorous costs analysis of the cumulative impact of all the changes. In addition, the Committee found that the Council failed to provide the Committee with a cost-benefit analysis of the proposed changes and pursuant to the requirements of RCW 34.05.328.

The Committee strongly supports a process that makes thoughtful and informed progress towards changes that result in improved energy efficiency in our buildings, wherever practicable. While the Council worked diligently, it is the opinion of the Committee that the Council did not fully develop and consider the economic impacts and costs versus benefits of these significant changes to our Energy Code. Furthermore, it is the opinion of the Committee that the Council and the Legislature need this information to fully evaluate the value, impacts, and consequences of the proposed codes, with due diligence to their respective fiduciary responsibilities, in order to create the best informed public policy.

As a result, the Committee recommends that the Governor suspend the adoption and implementation of the changes to the Energy Code, Chapter 51-11 WAC, adopted by the Council on November 20, 2009, until such time as a more adequate analysis has been completed and considered by the appropriate bodies.

For all of the above stated reasons, the Committee objects to the changes to the State Energy Code, Chapter 51-11 WAC, that were adopted by the Council on November 20, 2009, and hereby directs the Code Reviser, pursuant to RCW 34.05.640(4), to publish this Notice of Objection in the Washington State Register and along with any publication in the Washington Administrative Code of changes to Chapter 51-11 WAC that were adopted by the Council in 2009 and filed with the Code Reviser.

WAC 51-11-1437 Electric motor efficiency. Design A & B squirrel-cage, T-frame induction permanently wired polyphase motors of 1 hp or more having synchronous speeds of 3,600, 1,800 and 1,200 rpm shall have a nominal full-load motor efficiency no less than the corresponding values for energy efficient motors provided in Table 14-4.

EXCEPTIONS:
1. Motors used in systems designed to use more than one speed of a multispeed motor.
2. Motors used as a component of the equipment meeting the minimum equipment efficiency requirements of Section 1411 and Tables 14-1A through 14-1G provided that the motor input is included when determining the equipment efficiency.
3. Motors that are an integral part of specialized process equipment.
4. Where the motor is integral to a listed piece of equipment for which no complying motor has been approved.

Fan motors less than 1 hp in series terminal units shall be electronically commutated motors, or shall have a minimum motor efficiency of 65% when rated in accordance with NEMA Standard MG-1 at full load rating conditions.

[Statutory Authority: RCW 19.27A.025, 19.27A.045. 10-03-115, 10-13-113 and 10-22-056, § 51-11-1437, filed 1/20/10, 6/21/10 and 10/28/10, effective 1/1/11; 02-01-112, § 51-11-1437, filed 12/18/01, effective 7/1/02. Statutory Authority: RCW 19.27A.025. 93-21-052, § 51-11-1437, filed 10/18/93, effective 4/1/94.]

Reviser's note: Notice of Objection: The Joint Administrative Rules Review Committee (Committee) finds that, in adopting the 2009 proposed changes to the State Energy Code, Chapter 51-11 WAC, on November 20, 2009, the State Building Code Council (Council) failed to comply with all requirements of the law and failed to adequately respond to the Committee's request for additional economic impact and cost-benefit analyses prior to adoption.

On October 1, 2009, the Committee found that the Small Business Economic Impact Statement (SBEIS) for the proposed changes filed with the Code Reviser failed to comply with all requirements of law. The Committee requested that the Council conduct a cost-benefit analysis pursuant to RCW 34.05.328 and amend the SBEIS to provide additional economic impact information, including an estimate of the number of jobs that would be created or lost as a result of compliance with all the proposed rules, as required by RCW 19.85.040 (2)(d).

The Council provided the Committee with information and data on November 18, 2009. On December 2, 2009, the Committee found that the Council failed to adequately respond to the Committee's request for additional data. Specifically, the Committee found that the Council failed to amend the SBEIS to (a) estimate the number of jobs that would be created or lost as a result of compliance with the proposed changes; and (b) support the SBEIS with a detailed and rigorous costs analysis of the cumulative impact

of all the changes. In addition, the Committee found that the Council failed to provide the Committee with a cost-benefit analysis of the proposed changes and pursuant to the requirements of RCW 34.05.328.

The Committee strongly supports a process that makes thoughtful and informed progress towards changes that result in improved energy efficiency in our buildings, wherever practicable. While the Council worked diligently, it is the opinion of the Committee that the Council did not fully develop and consider the economic impacts and costs versus benefits of these significant changes to our Energy Code. Furthermore, it is the opinion of the Committee that the Council and the Legislature need this information to fully evaluate the value, impacts, and consequences of the proposed codes, with due diligence to their respective fiduciary responsibilities, in order to create the best informed public policy.

As a result, the Committee recommends that the Governor suspend the adoption and implementation of the changes to the Energy Code, Chapter 51-11 WAC, adopted by the Council on November 20, 2009, until such time as a more adequate analysis has been completed and considered by the appropriate bodies.

For all of the above stated reasons, the Committee objects to the changes to the State Energy Code, Chapter 51-11 WAC, that were adopted by the Council on November 20, 2009, and hereby directs the Code Reviser, pursuant to RCW 34.05.640(4), to publish this Notice of Objection in the Washington State Register and along with any publication in the Washington Administrative Code of changes to Chapter 51-11 WAC that were adopted by the Council in 2009 and filed with the Code Reviser.

WAC 51-11-1438 System criteria. For fans and pumps 7.5 horsepower and greater including custom and packaged air handlers serving variable air volume fan systems, constant volume fans, heating and cooling hydronic pumping systems, pool and service water pumping systems, domestic water pressure boosting systems, cooling tower fan, and other pumps or fans where variable flows are required, there shall be:

a. Variable speed drives, or

b. Other controls and devices that will result in fan and pump motor demand of no more than 30% of design wattage at 50% of design air volume for fans when static pressure set point equals 1/3 the total design static pressure, and 50% of design water flow for pumps, based on manufacturer's certified test data. Variable inlet vanes, throttling valves (dampers), scroll dampers or bypass circuits shall not be allowed.

EXCEPTION: Variable speed devices are not required for motors that serve:
1. Fans or pumps in packaged equipment where variable speed drives are not available as a factory option from the equipment manufacturer.
2. Fans or pumps that are required to operate only for emergency fire-life-safety events (e.g., stairwell pressurization fans, elevator pressurization fans, fire pumps, etc.).

1438.1 Heat rejection equipment: The requirements of this section apply to heat rejection equipment used in comfort cooling systems such as air-cooled condensers, open cooling towers, closed-circuit cooling towers, and evaporative condensers.

EXCEPTION: Heat rejection devices included as an integral part of equipment listed in Tables 14-1A through 14-1D.

Heat rejection equipment shall have a minimum efficiency performance not less than values specified in Table 14-1G. These requirements apply to all propeller, axial fan and centrifugal fan cooling towers. Table 14-1G specifies requirements for air-cooled condensers that are within rating conditions specified within the table.

1438.1.1 Variable flow controls: Cooling tower fans 7.5 hp and greater shall have control devices that vary flow by controlling leaving fluid temperature or condenser temperature/pressure of the heat rejection device.

1438.1.2 Limitation on centrifugal fan cooling towers: Open cooling towers with a combined rated capacity of 1,100 gpm and greater at 95°F condenser water return, 85°F condenser water supply and 75°F outdoor wet-bulb temperature shall meet the energy efficiency requirement for axial fan open circuit cooling towers.

EXCEPTION: Open circuit cooling towers that are ducted (inlet or discharge) or have external sound attenuation that requires external static pressure capability.

1438.2 Hot gas bypass limitation: Cooling equipment with direct expansion coils rated at greater than 95,000 Btu/h total cooling capacity shall have a minimum of 2 stages of cooling capacity or capacity modulation other than hot gas bypass that is capable of reducing input and output by at least 50%.

1438.3 Large volume fan systems: Single or multiple fan systems serving a zone or adjacent zones without separating walls with total air flow over 10,000 cfm (3,540 L/s) are required to reduce airflow based on space thermostat heating and cooling demand. A variable speed drive shall reduce airflow to a maximum 75% of peak airflow or minimum ventilation air requirement as required by Section 403 of the IMC, whichever is greater.

EXCEPTIONS: 1. Systems where the function of the supply air is for purposes other than temperature control, such as maintaining specific humidity levels or supplying an exhaust system.
2. Dedicated outdoor air supply unit(s) with heat recovery where airflow is equal to the minimum ventilation requirements and other fans cycle off unless heating or cooling is required.
3. An area served by multiple units where designated ventilation units have 50% or less of total area airflow and nonventilation unit fans cycle off when heating or cooling is not required.

[Statutory Authority: RCW 19.27A.025, 19.27A.045. 10-22-057, § 51-11-1438, filed 10/28/10, effective 1/1/11; 10-03-115, 10-13-113 and 10-22-056, § 51-11-1438, filed 1/20/10, 6/21/10 and 10/28/10, effective 1/1/11. Statutory Authority: RCW 19.27A.022, 19.27A.025, 19.27A.045, and chapters 19.27 and 34.05 RCW. 07-01-089, § 51-11-1438, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27A.025, 19.27A.045. 01-03-010, § 51-11-1438, filed 1/5/01, effective 7/1/01. Statutory Authority: RCW 19.27A.025. 93-21-052, § 51-11-1438, filed 10/18/93, effective 4/1/94.]

Reviser's note: Notice of Objection: The Joint Administrative Rules Review Committee (Committee) finds that, in adopting the 2009 proposed changes to the State Energy Code, Chapter 51-11 WAC, on November 20, 2009, the State Building Code Council (Council) failed to comply with all requirements of the law and failed to adequately respond to the Committee's request for additional economic impact and cost-benefit analyses prior to adoption.

On October 1, 2009, the Committee found that the Small Business Economic Impact Statement (SBEIS) for the proposed changes filed with the Code Reviser failed to comply with all requirements of law. The Committee requested that the Council conduct a cost-benefit analysis pursuant to RCW 34.05.328 and amend the SBEIS to provide additional economic impact information, including an estimate of the number of jobs that would be created or lost as a result of compliance with all the proposed rules, as required by RCW 19.85.040 (2)(d).

The Council provided the Committee with information and data on November 18, 2009. On December 2, 2009, the Committee found that the Council failed to adequately respond to the Committee's request for additional data. Specifically, the Committee found that the Council failed to amend the SBEIS to (a) estimate the number of jobs that would be created or lost as a result of compliance with the proposed changes; and (b) support the SBEIS with a detailed and rigorous costs analysis of the cumulative impact of all the changes. In addition, the Committee found that the Council failed

to provide the Committee with a cost-benefit analysis of the proposed changes and pursuant to the requirements of RCW 34.05.328.

The Committee strongly supports a process that makes thoughtful and informed progress towards changes that result in improved energy efficiency in our buildings, wherever practicable. While the Council worked diligently, it is the opinion of the Committee that the Council did not fully develop and consider the economic impacts and costs versus benefits of these significant changes to our Energy Code. Furthermore, it is the opinion of the Committee that the Council and the Legislature need this information to fully evaluate the value, impacts, and consequences of the proposed codes, with due diligence to their respective fiduciary responsibilities, in order to create the best informed public policy.

As a result, the Committee recommends that the Governor suspend the adoption and implementation of the changes to the Energy Code, Chapter 51-11 WAC, adopted by the Council on November 20, 2009, until such time as a more adequate analysis has been completed and considered by the appropriate bodies.

For all of the above stated reasons, the Committee objects to the changes to the State Energy Code, Chapter 51-11 WAC, that were adopted by the Council on November 20, 2009, and hereby directs the Code Reviser, pursuant to RCW 34.05.640(4), to publish this Notice of Objection in the Washington State Register and along with any publication in the Washington Administrative Code of changes to Chapter 51-11 WAC that were adopted by the Council in 2009 and filed with the Code Reviser.

WAC 51-11-1439 Exhaust systems.

1439.1 **Kitchen Hoods.** Each kitchen area with total exhaust capacity larger than 2000 cfm shall be provided with make-up air sized so that at least 50% of exhaust air volume be (a) unheated or heated to no more than 60°F and (b) uncooled or cooled without the use of mechanical cooling.

EXCEPTIONS:
1. Where hoods are used to exhaust ventilation air which would otherwise exfiltrate or be exhausted by other fan systems. A detailed accounting of exhaust airflows shall be provided on the plans that accounts for the impact of any required demand controlled ventilation.
2. Certified grease extractor hoods that require a face velocity no greater than 60 fpm.

1439.2 **Laboratory Exhaust Systems.** Buildings with laboratory exhaust systems having a total exhaust rate greater than 5,000 cfm (2,360 L/s) shall include heat recovery systems to precondition makeup air from laboratory exhaust. The heat recovery system shall be capable of increasing the outside air supply temperature at design heating conditions by 25°F (13.9°C) in Climate Zone 1 and 35°F (19.4°C) in Climate Zone 2. A provision shall be made to bypass or control the heat recovery system to permit air economizer operation as required by Section 1433.

EXCEPTIONS:
1. Variable air volume laboratory exhaust and room supply systems capable of reducing exhaust and make-up air volume to 50% or less of design values; or
2. Direct make-up (auxiliary) air supply equal to at least 75% of the exhaust rate, heated no warmer than 2°F (1.1°C) below room set point, cooled to no cooler than 3°F (1.7°C) above room set point, no humidification added, and no simultaneous heating and cooling used for dehumidification control; or
3. Combined Energy Reduction Method: VAV exhaust and room supply system capable of reducing exhaust and makeup air volumes and a heat recovery system to precondition makeup air from laboratory exhaust that when combined will produce the same energy reduction as achieved by a heat recovery system with a 50% sensible recovery effectiveness as required above. For calculation purposes the heat recovery component can be assumed to include the maximum design supply airflow rate at design conditions. The combined energy reduction (Q_{ER}) shall meet the following:

$$Q_{ER} \geq Q_{MIN}$$
$$Q_{MIN} = CFM_S \bullet (T_R - T_O) \bullet 1.1 \bullet 0.6$$
$$Q_{ER} = CFM_s \bullet (T_R - T_o) \bullet 1.1(A + B)/100$$

Where:

Q_{MIN}	=	Energy recovery at 60% sensible effectiveness (Btu/hr).
Q_{ER}	=	Combined energy reduction (Btu/hr).
CFM_s	=	The maximum design supply airflow rate to conditioned spaces served by the system in cubic feet per minute.
T_R	=	Space return air dry bulb at winter design conditions.
T_O	=	Outdoor air dry bulb at winter design conditions.
A	=	Percentage that the exhaust and makeup air volumes can be reduced from design conditions.
B	=	Percentage sensible heat recovery effectiveness.

[Statutory Authority: RCW 19.27A.025, 19.27A.045. 10-03-115, 10-13-113 and 10-22-056, § 51-11-1439, filed 1/20/10, 6/21/10 and 10/28/10, effective 1/1/11; 01-03-010, § 51-11-1439, filed 1/5/01, effective 7/1/01.]

Reviser's note: Notice of Objection: The Joint Administrative Rules Review Committee (Committee) finds that, in adopting the 2009 proposed changes to the State Energy Code, Chapter 51-11 WAC, on November 20, 2009, the State Building Code Council (Council) failed to comply with all requirements of the law and failed to adequately respond to the Committee's request for additional economic impact and cost-benefit analyses prior to adoption.

On October 1, 2009, the Committee found that the Small Business Economic Impact Statement (SBEIS) for the proposed changes filed with the Code Reviser failed to comply with all requirements of law. The Committee requested that the Council conduct a cost-benefit analysis pursuant to RCW 34.05.328 and amend the SBEIS to provide additional economic impact information, including an estimate of the number of jobs that would be created or lost as a result of compliance with all the proposed rules, as required by RCW 19.85.040 (2)(d).

The Council provided the Committee with information and data on November 18, 2009. On December 2, 2009, the Committee found that the Council failed to adequately respond to the Committee's request for additional data. Specifically, the Committee found that the Council failed to amend the SBEIS to (a) estimate the number of jobs that would be created or lost as a result of compliance with the proposed changes; and (b) support the SBEIS with a detailed and rigorous costs analysis of the cumulative impact of all the changes. In addition, the Committee found that the Council failed to provide the Committee with a cost-benefit analysis of the proposed changes and pursuant to the requirements of RCW 34.05.328.

The Committee strongly supports a process that makes thoughtful and informed progress towards changes that result in improved energy efficiency in our buildings, wherever practicable. While the Council worked diligently, it is the opinion of the Committee that the Council did not fully develop and consider the economic impacts and costs versus benefits of these significant changes to our Energy Code. Furthermore, it is the opinion of the Committee that the Council and the Legislature need this information to fully evaluate the value, impacts, and consequences of the proposed codes, with due diligence to their respective fiduciary responsibilities, in order to create the best informed public policy.

As a result, the Committee recommends that the Governor suspend the adoption and implementation of the changes to the Energy Code, Chapter 51-11 WAC, adopted by the Council on November 20, 2009, until such time as a more adequate analysis has been completed and considered by the appropriate bodies.

For all of the above stated reasons, the Committee objects to the changes to the State Energy Code, Chapter 51-11 WAC, that were adopted by the Council on November 20, 2009, and hereby directs the Code Reviser, pursuant to RCW 34.05.640(4), to publish this Notice of Objection in the

Washington State Register and along with any publication in the Washington Administrative Code of changes to Chapter 51-11 WAC that were adopted by the Council in 2009 and filed with the Code Reviser.

WAC 51-11-1440 Domestic water systems. Service water heating equipment shall comply with the applicable efficiencies in Tables 14-1A through 14-1G.

[Statutory Authority: RCW 19.27A.025, 19.27A.045. 10-03-115, 10-13-113 and 10-22-056, § 51-11-1440, filed 1/20/10, 6/21/10 and 10/28/10, effective 1/1/11. Statutory Authority: RCW 19.27A.025. 93-21-052, § 51-11-1440, filed 10/18/93, effective 4/1/94.]

Reviser's note: Notice of Objection: The Joint Administrative Rules Review Committee (Committee) finds that, in adopting the 2009 proposed changes to the State Energy Code, Chapter 51-11 WAC, on November 20, 2009, the State Building Code Council (Council) failed to comply with all requirements of the law and failed to adequately respond to the Committee's request for additional economic impact and cost-benefit analyses prior to adoption.

On October 1, 2009, the Committee found that the Small Business Economic Impact Statement (SBEIS) for the proposed changes filed with the Code Reviser failed to comply with all requirements of law. The Committee requested that the Council conduct a cost-benefit analysis pursuant to RCW 34.05.328 and amend the SBEIS to provide additional economic impact information, including an estimate of the number of jobs that would be created or lost as a result of compliance with all the proposed rules, as required by RCW 19.85.040 (2)(d).

The Council provided the Committee with information and data on November 18, 2009. On December 2, 2009, the Committee found that the Council failed to adequately respond to the Committee's request for additional data. Specifically, the Committee found that the Council failed to amend the SBEIS to (a) estimate the number of jobs that would be created or lost as a result of compliance with the proposed changes; and (b) support the SBEIS with a detailed and rigorous costs analysis of the cumulative impact of all the changes. In addition, the Committee found that the Council failed to provide the Committee with a cost-benefit analysis of the proposed changes and pursuant to the requirements of RCW 34.05.328.

The Committee strongly supports a process that makes thoughtful and informed progress towards changes that result in improved energy efficiency in our buildings, wherever practicable. While the Council worked diligently, it is the opinion of the Committee that the Council did not fully develop and consider the economic impacts and costs versus benefits of these significant changes to our Energy Code. Furthermore, it is the opinion of the Committee that the Council and the Legislature need this information to fully evaluate the value, impacts, and consequences of the proposed codes, with due diligence to their respective fiduciary responsibilities, in order to create the best informed public policy.

As a result, the Committee recommends that the Governor suspend the adoption and implementation of the changes to the Energy Code, Chapter 51-11 WAC, adopted by the Council on November 20, 2009, until such time as a more adequate analysis has been completed and considered by the appropriate bodies.

For all of the above stated reasons, the Committee objects to the changes to the State Energy Code, Chapter 51-11 WAC, that were adopted by the Council on November 20, 2009, and hereby directs the Code Reviser, pursuant to RCW 34.05.640(4), to publish this Notice of Objection in the Washington State Register and along with any publication in the Washington Administrative Code of changes to Chapter 51-11 WAC that were adopted by the Council in 2009 and filed with the Code Reviser.

WAC 51-11-1444 Conservation of water and pumping energy. Pumps for all domestic water systems shall comply with Section 1438.

[Statutory Authority: RCW 19.27A.025, 19.27A.045. 10-03-115, 10-13-113 and 10-22-056, § 51-11-1444, filed 1/20/10, 6/21/10 and 10/28/10, effective 1/1/11.]

Reviser's note: Notice of Objection: The Joint Administrative Rules Review Committee (Committee) finds that, in adopting the 2009 proposed changes to the State Energy Code, Chapter 51-11 WAC, on November 20, 2009, the State Building Code Council (Council) failed to comply with all requirements of the law and failed to adequately respond to the Committee's request for additional economic impact and cost-benefit analyses prior to adoption.

On October 1, 2009, the Committee found that the Small Business Economic Impact Statement (SBEIS) for the proposed changes filed with the Code Reviser failed to comply with all requirements of law. The Committee requested that the Council conduct a cost-benefit analysis pursuant to RCW 34.05.328 and amend the SBEIS to provide additional economic impact information, including an estimate of the number of jobs that would be created or lost as a result of compliance with all the proposed rules, as required by RCW 19.85.040 (2)(d).

The Council provided the Committee with information and data on November 18, 2009. On December 2, 2009, the Committee found that the Council failed to adequately respond to the Committee's request for additional data. Specifically, the Committee found that the Council failed to amend the SBEIS to (a) estimate the number of jobs that would be created or lost as a result of compliance with the proposed changes; and (b) support the SBEIS with a detailed and rigorous costs analysis of the cumulative impact of all the changes. In addition, the Committee found that the Council failed to provide the Committee with a cost-benefit analysis of the proposed changes and pursuant to the requirements of RCW 34.05.328.

The Committee strongly supports a process that makes thoughtful and informed progress towards changes that result in improved energy efficiency in our buildings, wherever practicable. While the Council worked diligently, it is the opinion of the Committee that the Council did not fully develop and consider the economic impacts and costs versus benefits of these significant changes to our Energy Code. Furthermore, it is the opinion of the Committee that the Council and the Legislature need this information to fully evaluate the value, impacts, and consequences of the proposed codes, with due diligence to their respective fiduciary responsibilities, in order to create the best informed public policy.

As a result, the Committee recommends that the Governor suspend the adoption and implementation of the changes to the Energy Code, Chapter 51-11 WAC, adopted by the Council on November 20, 2009, until such time as a more adequate analysis has been completed and considered by the appropriate bodies.

For all of the above stated reasons, the Committee objects to the changes to the State Energy Code, Chapter 51-11 WAC, that were adopted by the Council on November 20, 2009, and hereby directs the Code Reviser, pursuant to RCW 34.05.640(4), to publish this Notice of Objection in the Washington State Register and along with any publication in the Washington Administrative Code of changes to Chapter 51-11 WAC that were adopted by the Council in 2009 and filed with the Code Reviser.

WAC 51-11-1445 Heat recovery for domestic water systems. Condenser water heat recovery systems shall be installed for heating or preheating of service hot water provided all of the following are true:

1. The total installed heat rejection capacity of the water-cooled systems exceeds 1,500,000 Btu/h of heat rejection; and

2. The capacity of service water heating equipment exceeds 250,000 Btu/h.

The required heat recovery system shall have the capacity to provide the smaller of:

1. 60% of the peak heat rejection load at design conditions; or

2. Preheat of the peak service hot water draw to 85°F; or

3. 50% of the service water heating load.

EXCEPTIONS:
1. Facilities that employ condenser heat recovery for space heating with a heat recovery design exceeding 30% of the peak water-cooled condenser load at design conditions.
2. Facilities that provide 60% of their service water heating from site solar or site recovered energy or from other sources.

[Statutory Authority: RCW 19.27A.025, 19.27A.045. 10-03-115, 10-13-113 and 10-22-056, § 51-11-1445, filed 1/20/10, 6/21/10 and 10/28/10, effective 1/1/11.]

Reviser's note: Notice of Objection: The Joint Administrative Rules Review Committee (Committee) finds that, in adopting the 2009 proposed changes to the State Energy Code, Chapter 51-11 WAC, on November 20, 2009, the State Building Code Council (Council) failed to comply with all

requirements of the law and failed to adequately respond to the Committee's request for additional economic impact and cost-benefit analyses prior to adoption.

On October 1, 2009, the Committee found that the Small Business Economic Impact Statement (SBEIS) for the proposed changes filed with the Code Reviser failed to comply with all requirements of law. The Committee requested that the Council conduct a cost-benefit analysis pursuant to RCW 34.05.328 and amend the SBEIS to provide additional economic impact information, including an estimate of the number of jobs that would be created or lost as a result of compliance with all the proposed rules, as required by RCW 19.85.040 (2)(d).

The Council provided the Committee with information and data on November 18, 2009. On December 2, 2009, the Committee found that the Council failed to adequately respond to the Committee's request for additional data. Specifically, the Committee found that the Council failed to amend the SBEIS to (a) estimate the number of jobs that would be created or lost as a result of compliance with the proposed changes; and (b) support the SBEIS with a detailed and rigorous costs analysis of the cumulative impact of all the changes. In addition, the Committee found that the Council failed to provide the Committee with a cost-benefit analysis of the proposed changes and pursuant to the requirements of RCW 34.05.328.

The Committee strongly supports a process that makes thoughtful and informed progress towards changes that result in improved energy efficiency in our buildings, wherever practicable. While the Council worked diligently, it is the opinion of the Committee that the Council did not fully develop and consider the economic impacts and costs versus benefits of these significant changes to our Energy Code. Furthermore, it is the opinion of the Committee that the Council and the Legislature need this information to fully evaluate the value, impacts, and consequences of the proposed codes, with due diligence to their respective fiduciary responsibilities, in order to create the best informed public policy.

As a result, the Committee recommends that the Governor suspend the adoption and implementation of the changes to the Energy Code, Chapter 51-11 WAC, adopted by the Council on November 20, 2009, until such time as a more adequate analysis has been completed and considered by the appropriate bodies.

For all of the above stated reasons, the Committee objects to the changes to the State Energy Code, Chapter 51-11 WAC, that were adopted by the Council on November 20, 2009, and hereby directs the Code Reviser, pursuant to RCW 34.05.640(4), to publish this Notice of Objection in the Washington State Register and along with any publication in the Washington Administrative Code of changes to Chapter 51-11 WAC that were adopted by the Council in 2009 and filed with the Code Reviser.

WAC 51-11-1446 Domestic hot water meters. Each individual dwelling unit in a Group R-2 Multi-Family residential occupancy with central service shall be provided with a domestic hot water meter to allow for domestic hot water billing based on actual domestic hot water usage.

[Statutory Authority: RCW 19.27A.025, 19.27A.045. 10-03-115, 10-13-113 and 10-22-056, § 51-11-1446, filed 1/20/10, 6/21/10 and 10/28/10, effective 1/1/11.]

Reviser's note: Notice of Objection: The Joint Administrative Rules Review Committee (Committee) finds that, in adopting the 2009 proposed changes to the State Energy Code, Chapter 51-11 WAC, on November 20, 2009, the State Building Code Council (Council) failed to comply with all requirements of the law and failed to adequately respond to the Committee's request for additional economic impact and cost-benefit analyses prior to adoption.

On October 1, 2009, the Committee found that the Small Business Economic Impact Statement (SBEIS) for the proposed changes filed with the Code Reviser failed to comply with all requirements of law. The Committee requested that the Council conduct a cost-benefit analysis pursuant to RCW 34.05.328 and amend the SBEIS to provide additional economic impact information, including an estimate of the number of jobs that would be created or lost as a result of compliance with all the proposed rules, as required by RCW 19.85.040 (2)(d).

The Council provided the Committee with information and data on November 18, 2009. On December 2, 2009, the Committee found that the Council failed to adequately respond to the Committee's request for additional data. Specifically, the Committee found that the Council failed to amend the SBEIS to (a) estimate the number of jobs that would be created or lost as a result of compliance with the proposed changes; and (b) support the SBEIS with a detailed and rigorous costs analysis of the cumulative impact of all the changes. In addition, the Committee found that the Council failed to provide the Committee with a cost-benefit analysis of the proposed changes and pursuant to the requirements of RCW 34.05.328.

The Committee strongly supports a process that makes thoughtful and informed progress towards changes that result in improved energy efficiency in our buildings, wherever practicable. While the Council worked diligently, it is the opinion of the Committee that the Council did not fully develop and consider the economic impacts and costs versus benefits of these significant changes to our Energy Code. Furthermore, it is the opinion of the Committee that the Council and the Legislature need this information to fully evaluate the value, impacts, and consequences of the proposed codes, with due diligence to their respective fiduciary responsibilities, in order to create the best informed public policy.

As a result, the Committee recommends that the Governor suspend the adoption and implementation of the changes to the Energy Code, Chapter 51-11 WAC, adopted by the Council on November 20, 2009, until such time as a more adequate analysis has been completed and considered by the appropriate bodies.

For all of the above stated reasons, the Committee objects to the changes to the State Energy Code, Chapter 51-11 WAC, that were adopted by the Council on November 20, 2009, and hereby directs the Code Reviser, pursuant to RCW 34.05.640(4), to publish this Notice of Objection in the Washington State Register and along with any publication in the Washington Administrative Code of changes to Chapter 51-11 WAC that were adopted by the Council in 2009 and filed with the Code Reviser.

WAC 51-11-1454 Pool covers and insulation. Heated pools shall be equipped with a vapor retardant pool cover on or at the water surface. Pools heated to more than 90 degrees F shall have a pool cover with a minimum insulation value of R-12, and the sides and bottom of the pool shall also have a minimum insulation value of R-12.

1455 Heat Recovery. Heated indoor swimming pools, spas or hot tubs with water surface area greater than 200 square feet shall provide for energy conservation by an exhaust air heat recovery system that heats ventilation air, pool water or domestic hot water. The heat recovery system shall be capable of decreasing the exhaust air temperature at design heating conditions (80°F indoor) by 36°F (10.0°C) in Climate Zone 1 and 48°F (26.7°C) in Climate Zone 2.

EXCEPTION: Pools, spas or hot tubs that include system(s) that provide equivalent recovered energy on an annual basis through one of the following methods:
1. Renewable energy;
2. Dehumidification heat recovery;
3. Waste heat recovery; or
4. A combination of these system(s) sources capable of providing at least 70 percent of the heating energy required over an operating season.

Table 14-1A
Unitary Air Conditioners and Condensing Units, Electrically Operated, Minimum Efficiency Requirements

Equipment Type	Size Category	Sub-Category or Rating Condition	Minimum Efficiency[b]	Test Procedure[a]
Air Conditioners, Air Cooled	< 65,000 Btu/h[d]	Split System	13.0 SEER	AHRI 210/240
		Single Package	13.0 SEER	

Equipment Type	Size Category	Sub-Category or Rating Condition	Minimum Efficiency[b]	Test Procedure[a]
	≥ 65,000 Btu/h and < 135,000 Btu/h	Split System and Single Package	11.2 EER[c] 11.4 IEER[c]	AHRI 340/360
	≥ 135,000 Btu/h and < 240,000 Btu/h	Split System and Single Package	11.0 EER[c] 11.2 IEER[c]	
	≥ 240,000 Btu/h and < 760,000 Btu/h	Split System and Single Package	10.0 EER[c] 10.1 IEER[c]	
	≥ 760,000 Btu/h	Split System and Single Package	9.7 EER[c] 9.8 IEER[c]	
Through-the-Wall, Air Cooled	< 30,000 Btu/h[d]	Split System	12.0 SEER	AHRI 210/240
		Single Package	12.0 SEER	
Small-Duct High-Velocity, Air Cooled	< 65,000 Btu/h[d]	Split System	10.0 SEER	AHRI 210/240
Air Conditioners, Water and Evaporatively Cooled	< 65,000 Btu/h	Split System and Single Package	12.1 EER[c] 12.3 IEER[c]	AHRI 210/240
	≥ 65,000 Btu/h and < 135,000 Btu/h	Split System and Single Package	11.5 EER[c] 11.7 IEER[c]	AHRI 340/360
	≥ 135,000 Btu/h and ≤ 240,000 Btu/h	Split System and Single Package	11.0 EER[c] 11.2 IEER[c]	
	> 240,000 Btu/h	Split System and Single Package	11.0 EER[c] 11.1 IEER[c]	
Condensing Units, Air Cooled	≥ 135,000 Btu/h		10.1 EER 11.2 IPLV	AHRI 365
Condensing Units, Water or Evaporatively Cooled	≥ 135,000 Btu/h		13.1 EER 13.1 IPLV	

[a] Reserved.

[b] IPLVs are only applicable to equipment with capacity modulation.

[c] Deduct 0.2 from the required EERs and IEERs for units with a heating section other than electric resistance heat.

[d] Applies to all units, including single-phase and three-phase. For single-phase air-cooled air-conditioners < 65,000 Btu/h, SEER values are those set by NAECA.

[e] Reserved.

Table 14-1B
Unitary and Applied Heat Pumps, Electrically Operated, Minimum Efficiency Requirements

Equipment Type	Size Category	Sub-Category or Rating Condition	Minimum Efficiency[b]	Test Procedure[a]
Air Cooled, (Cooling Mode)	< 65,000 Btu/h[d]	Split System	13.0 SEER	AHRI 210/240
		Single Package	13.0 SEER	
	≥ 65,000 Btu/h and < 135,000 Btu/h	Split System and Single Package	11.0 EER[c] 11.2 IEER[c]	AHRI 340/360
	≥ 135,000 Btu/h and < 240,000 Btu/h	Split System and Single Package	10.6 EER[c] 10.7 IEER[c]	
	≥ 240,000 Btu/h	Split System and Single Package	9.5 EER[c] 9.6 IEER[c]	
Through-the-Wall (Air Cooled, Cooling Mode)	< 30,000 Btu/h[d]	Split System	12.0 SEER	AHRI 210/240
		Single Package	12.0 SEER	
Small-Duct High-Velocity (Air Cooled, Cooling Mode)	< 65,000 Btu/h[d]	Split System	10.0 SEER	AHRI 210/240
Water-Source (Cooling Mode)	< 17,000 Btu/h	86°F Entering Water	11.2 EER	AHRI/ISO-13256-1
	≥ 17,000 Btu/h and < 65,000 Btu/h	86°F Entering Water	12.0 EER	AHRI/ISO-13256-1
	≥ 65,000 Btu/h and < 135,000 Btu/h	86°F Entering Water	12.0 EER	AHRI/ISO-13256-1
Groundwater-Source (Cooling Mode)	< 135,000 Btu/h	59°F Entering Water	16.2 EER	AHRI/ISO-13256-1
Ground Source (Cooling Mode)	< 135,000 Btu/h	77°F Entering Water	13.4 EER	AHRI/ISO-13256-1

Equipment Type	Size Category	Sub-Category or Rating Condition	Minimum Efficiency[b]	Test Procedure[a]
Air Cooled (Heating Mode)	< 65,000 Btu/h[d] (Cooling Capacity)	Split System	7.7 HSPF	AHRI 210/240
		Single Package	7.7 HSPF	
	≥ 65,000 Btu/h and < 135,000 Btu/h (Cooling Capacity)	47°F db/43°F wb Outdoor Air	3.3 COP	AHRI 340/360
		17°F db/15°F wb Outdoor Air	2.25 COP	
	≥ 135,000 Btu/h (Cooling Capacity)	47°F db/43°F wb Outdoor Air	3.2 COP	
		17°F db/15°F wb Outdoor Air	2.05 COP	
Through-the-Wall (Air Cooled, Heating Mode)	< 30,000 Btu/h[d]	Split System	7.4 HSPF	AHRI 210/240
		Single Package	7.4 HSPF	
Small-Duct High-Velocity (Air Cooled, Heating Mode)	< 65,000 Btu/h[d]	Split System	6.8 HSPF	AHRI 210/240
Water-Source (Heating Mode)	< 135,000 Btu/h (Cooling Capacity)	68°F Entering Water	4.2 COP	AHRI/ISO-13256-1
Groundwater-Source (Heating Mode)	< 135,000 Btu/h (Cooling Capacity)	50°F Entering Water	3.6 COP	AHRI/ISO-13256-1
Ground Source (Heating Mode)	< 135,000 Btu/h (Cooling Capacity)	32°F Entering Water	3.1 COP	AHRI/ISO-13256-1

[a] Reserved.

[b] IPLVs and part load rating conditions are only applicable to equipment with capacity modulation.

[c] Deduct 0.2 from the required EERs and IEERs for units with a heating section other than electric resistance heat.

[e] Reserved.

Table 14-1C
Water Chilling Packages, Minimum Efficiency Requirements[a]

			PATH A[b]		PATH B[b]		
Equipment Type	**Size Category**	**Units**	**Full Load**	**IPLV**	**Full Load**	**IPLV**	**Test Procedure[a]**
Air-Cooled Chillers[e]	<150 tons	EER	>9.562	>12.500	NA[c]	NA[c]	AHRI 550/590-03
	≥150 tons	EER	>9.562	>12.750	NA[c]	NA[c]	
Air-Cooled Without Condenser, Electrically Operated[e]	All Capacities	Air-cooled chillers without condensers must be rated with matching condensers and comply with the air-cooled chiller efficiency requirements					
Water-Cooled, Electrically Operated, Reciprocating	All Capacities	Reciprocating units must comply with water cooled positive displacement efficiency requirements					
Water-Cooled, Electrically Operated, Positive Displacement	<75 tons	kW/ton	<0.780	<0.630	<0.800	<0.600	
	≥75 tons and <150 tons	kW/ton	<0.775	<0.615	<0.790	<0.586	
	≥150 tons and <300 tons	kW/ton	<0.680	<0.580	<0.718	<0.540	
	≥300 tons	kW/ton	<0.620	<0.540	<0.639	<0.490	
Water-Cooled, Electrically Operated, Centrifugal	<150 tons	kW/ton	<0.634	<0.596	<0.639	<0.450	
	≥150 tons and <300 tons	kW/ton	<0.634	<0.596	<0.639	<0.450	
	≥300 tons and <600 tons	kW/ton	<0.576	<0.549	<0.600	<0.400	
	≥600 tons	kW/ton	<0.570	<0.539	<0.590	<0.400	
Air-Cooled Absorption Single Effect	All Capacities	COP	>0.600	NR[d]	NA[c]	NA[c]	AHRI 560-92
Water-Cooled Absorption Single Effect	All Capacities	COP	>0.700	NR[d]	NA[c]	NA[c]	
Absorption Double Effect	All Capacities	COP	>1.000	>1.050	NA[c]	NA[c]	

			PATH A[b]		PATH B[b]		
Equipment Type	**Size Category**	**Units**	**Full Load**	**IPLV**	**Full Load**	**IPLV**	**Test Procedure[a]**
Absorption Double Effect Direct Fired	All Capacities	COP	>1.000	>1.000	NA[c]	NA[c]	

For SI: [1]Btu/hr 0.2931 W

[a]The chiller equipment requirements do not apply for chillers used in low temperature applications where the design leaving fluid temperature is <38°F.

[b]Compliance with this standard can be obtained by meeting the minimum requirements of Path A or Path B. However, both the full and IPLV must be met to fulfill the requirements of Path A or Path B.

[c]NA means that this requirement is not applicable and cannot be used for compliance.

[d]NR means that there are no minimum requirements for this category.

[e]Chilled water plants and buildings with more than 500 tons total capacity shall not have more than 100 tons provided by air-cooled chillers.

Table 14-1D
Packaged Terminal Air Conditioners, Packaged Terminal Heat Pumps, Room Air Conditioners, and Room Air Conditioner Heat Pumps, Electrically Operated, Minimum Efficiency Requirements

Equipment Type	Size Category (Input)	Sub-Category or Rating Condition	Minimum Efficiency[b]	Test Procedure[a]
PTAC (Cooling Mode) Standard Size	All Capacities	95°F db Outdoor Air	12.5 - (0.213 x Cap/1000)[b] EER	AHRI 310/380
PTAC (Cooling Mode) Nonstandard Size[c]	All Capacities	95°F db Outdoor Air	10.9 - (0.213 x Cap/1000)[b] EER	
PTHP (Cooling Mode) Standard Size	All Capacities	95°F db Outdoor Air	12.3 - (0.213 x Cap/1000)[b] EER	
PTHP (Cooling Mode) Nonstandard Size[c]	All Capacities	95°F db Outdoor Air	10.8 - (0.213 x Cap/1000)[b] EER	
PTHP (Heating Mode) New Construction	All Capacities		3.2 - (0.026 x Cap/1000)[b] COP	
PTHP (Heating Mode) Replacements[c]	All Capacities		2.9 - (0.026 x Cap/1000)[b] COP	
SPVAC (Cooling Mode)	<65,000 Btu/h	95°F db/75°F wb Outdoor Air	9.0 EER	AHRI-390
	≥65,000 Btu/h and <135,000 Btu/h	95°F db/75°F wb Outdoor Air	8.9 EER	
	≥135,000 Btu/h and <240,000 Btu/h	95°F db/75°F wb Outdoor Air	8.6 EER	
SPVHP (Cooling Mode)	<65,000 Btu/h	95°F db/75°F wb Outdoor Air	9.0 EER	AHRI-390
	≥65,000 Btu/h and <135,000 Btu/h	95°F db/75°F wb Outdoor Air	8.9 EER	
	≥135,000 Btu/h and <240,000 Btu/h	95°F db/75°F wb Outdoor Air	8.6 EER	
SPVAC (Heating Mode)	<65,000 Btu/h	47°F db/43°F wb Outdoor Air	3.0 COP	AHRI-390
	≥65,000 Btu/h and <135,000 Btu/h	47°F db/43°F wb Outdoor Air	3.0 COP	
	≥135,000 Btu/h and <240,000 Btu/h	47°F db/43°F wb Outdoor Air	2.9 COP	
Room Air Conditioners, with Louvered Sides	< 6,000 Btu/h		9.7 EER	ANSI/AHAM RAC-1
	≥ 6,000 Btu/h and < 8,000 Btu/h		9.7 EER	
	≥ 8,000 Btu/h and < 14,000 Btu/h		9.8 EER	
	≥ 14,000 Btu/h and < 20,000 Btu/h		9.7 EER	
	≥ 20,000 Btu/h		8.5 EER	
Room Air Conditioners, without Louvered Sides	< 8,000 Btu/h		9.0 EER	

Equipment Type	Size Category (Input)	Sub-Category or Rating Condition	Minimum Efficiency[b]	Test Procedure[a]
	≥ 8,000 Btu/h and < 20,000 Btu/h		8.5 EER	
	≥ 20,000 Btu/h		8.5 EER	
Room Air Conditioner Heat Pumps with Louvered Sides	< 20,000 Btu/h		9.0 EER	
	≥ 20,000 Btu/h		8.5 EER	
Room Air Conditioner Heat Pumps without Louvered Sides	< 14,000 Btu/h		8.5 EER	
	≥ 14,000 Btu/h		8.0 EER	
Room Air Conditioner, Casement Only	All Capacities		8.7 EER	
Room Air Conditioner, Casement –Slider	All Capacities		9.5 EER	

[a]Reserved.

[b]Cap means the rated cooling capacity of the product in Btu/h. If the unit's capacity is less than 7000 Btu/h, use 7000 Btu/h in the calculation. If the unit's capacity is greater than 15,000 Btu/h, use 15,000 Btu/h in the calculation.

[c] Nonstandard size units must be factory labeled as follows: "MANUFACTURED FOR NONSTANDARD SIZE APPLICATIONS ONLY; NOT TO BE INSTALLED IN NEW CONSTRUCTION PROJECTS." Nonstandard size efficiencies apply only to units being installed in existing sleeves having an external wall opening of less than 16-in. high or less than 42-in. wide, and having a cross-sectional area less than 670 in^2.

[d]Casement room air conditioners are not separate product classes under current minimum efficiency column.

[e]New room air conditioner standards, covered by NAECA became effective October 1, 2000.

Table 14-1E
Warm Air Furnaces and Combination Warm Air Furnaces/Air-Conditioning Units, Warm Air Duct Furnaces and Unit Heaters, Minimum Efficiency Requirements

Equipment Type	Size Category (Input)	Sub-Category or Rating Condition	Minimum Efficiency[b]	Test Procedure[a]
Warm Air Furnace, Gas-Fired	< 225,000 Btu/h (66 kW)		78% AFUE or 80% E_t[c]	DOE 10 CFR Part 430 or ANSI Z21.47
	≥ 225,000 Btu/h (66 kW)	Maximum Capacity[c] Minimum Capacity[c]	80% E_c[f]	ANSI Z21.47
Warm Air Furnace, Oil-Fired	< 225,000 Btu/h (66 kW)		78% AFUE or 80% E_t[c]	DOE 10 CFR Part 430 or UL 727
	≥ 225,000 Btu/h (66 kW)	Maximum Capacity[b] Minimum Capacity[b]	81% E_t[g] ____	UL 727
Warm Air Duct Furnaces, Gas-Fired	All Capacities	Maximum Capacity[b] Minimum Capacity[b]	80% E_c[e] ____	ANSI Z83.9
Warm Air Unit Heaters, Gas-Fired	All Capacities	Maximum Capacity[b] Minimum Capacity[b]	80% E_c[h] ____	ANSI Z83.8
Warm Air Unit Heaters, Oil-Fired	All Capacities	Maximum Capacity[b] Minimum Capacity[b]	80% E_c[h] ____	UL 731

[a]Reserved.

[b]Minimum and maximum ratings as provided for and allowed by the unit's controls.

[c]Combination units not covered by NAECA (3-phase power or cooling capacity greater than or equal to 65,000 Btu/h [19 kW]) may comply with either rating.

[d]E_t = Thermal efficiency. See test procedure for detailed discussion.

[e]E_c = Combustion efficiency (100% less flue losses). See test procedure for detailed discussion.

[f]E_c = Combustion efficiency. Units must also include an IID, have jacket losses not exceeding 0.75% of the input rating, and have either power venting or a flue damper. A vent damper is an acceptable alternative to a flue damper for those furnaces where combustion air is drawn from the conditioned space.

[g]E_c = Combustion efficiency. Units must also include an IID, have jacket losses not exceeding 0.75% of the input rating, and have either power venting or a flue damper. A vent damper is an acceptable alternative to a flue damper for those furnaces where combustion air is drawn from the conditioned space.

[h]E_c = Combustion efficiency. Units must also include an IID, and have either power venting or a flue damper. A vent damper is an acceptable alternative to a flue damper for those unit heaters where combustion air is drawn from the conditioned space.

Table 14-1F
Boilers, Gas- and Oil-Fired, Minimum Efficiency Requirements

Equipment Type[f]	SubCategory	Size Category[b]	Minimum Efficiency[b]	Test Procedure
Boilers, Hot Water	Gas-fired	<300,000 Btu/h	80% AFUE	DOE 10 CFR Part 430
		≥300,000 Btu/h and ≤2,500,000 Btu/h	80% E_t	DOE 10 CFR Part 431
		>2,500,000 Btu/h[a]	82% E_c	
	Oil-fired[c]	<300,000 Btu/h	80% AFUE	DOE 10 CFR Part 430
		≥300,000 Btu/h and ≤2,500,000 Btu/h	82% E_t	DOE 10 CFR Part 431
		>2,500,000 Btu/h[a]	84% E_c	
Boilers, Steam	Gas-fired	<300,000 Btu/h	75% AFUE	DOE 10 CFR Part 430
	Gas-fired - all except natural draft	≥300,000 Btu/h and ≤2,500,000 Btu/h	79% E_t	DOE 10 CFR Part 431
		>2,500,000 Btu/h[a]	79% E_t	
	Gas-fired - natural draft	≥300,000 Btu/h and ≤2,500,000 Btu/h	77% E_t	DOE 10 CFR Part 431
		>2,500,000 Btu/h[a]	77% E_t	
	Oil-fired[c]	<300,000 Btu/h	80% AFUE	DOE 10 CFR Part 430
		≥300,000 Btu/h and ≤2,500,000 Btu/h	81% E_t	DOE 10 CFR Part 431
		>2,500,000 Btu/h[a]	81% E_t	

[a]These requirements apply to boilers with rated input of 8,000,000 Btu/h or less that are not packaged boilers, and to all packaged boilers. Minimum efficiency requirements for boilers cover all capacities of packaged boilers.
[b]Maximum capacity - Minimum and maximum ratings as provided for and allowed by the unit's controls.
[c]Includes oil-fired (residual).
E_c = Combustion efficiency (100% less flue losses). See reference document for detailed information.
E_t = Thermal efficiency. See reference document for detailed information.

Table 14-1G
Performance Requirements for Heat Rejection Equipment

Equipment Type	Total System Heat Rejection Capacity at Rated Conditions	Sub-Category or Rating Condition	Minimum Efficiency[b]	Test Procedure[c]
Propeller or Axial Fan, Open Circuit Cooling Towers	All	95°F (35°C) Entering Water 85°F (29°C) Leaving Water 75°F (24°C) wb Outdoor Air	≥ 38.2 gpm/hp (3.23 L/s-kW)	CTI ATC-105 and CTI STD-201
Centrifugal Fan, Open Circuit Cooling Towers	All	95°F (35°C) Entering Water 85°F (29°C) Leaving Water 75°F (24°C) wb Outdoor Air	≥ 20.0 gpm/hp (1.7 L/s-kW)	CTI ATC-105 and CTI STD-201
Propeller or Axial Fan, Closed Circuit Cooling Towers	All	102°F (39°C) Entering Water 90°F (32°C) Leaving Water 75°F (24°C) wb Outdoor Air	≥14.0 gpm/hp	CTI ATC-105S and CTI STD-201
Centrifugal Fan, Closed Circuit Cooling Towers	All	102°F (39°C) Entering Water 90°F (32°C) Leaving Water 75°F (24°C) wb Outdoor Air	≥7.0 gpm/hp	CTI ATC-105S and CTI STD-201

Equipment Type	Total System Heat Rejection Capacity at Rated Conditions	Sub-Category or Rating Condition	Minimum Efficiency[b]	Test Procedure[c]
Air Cooled Condensers	All	125°F (52°C) Condensing Temperature R22 Test Fluid 190°F (88°C) Entering Gas Temperature 15°F (8°C) Subcooling 95°F (35°C) Entering Drybulb	≥ 176,000 Btu/h•hp 69 COP	AHRI 460

[a]For purposes of this table, open circuit cooling tower performance is defined as the process water flow rating of tower at thermal rating conditions listed in this table divided by the fan nameplate rated motor power.

[b]For purposes of this table, closed circuit cooling tower performance is defined as the process water flow rating of tower at thermal conditions listed in this table divided by the sum of fan motor nameplate power.

[c]For purposes of this table air-cooled condenser performance is defined as the heat rejected from the refrigerant divided by the fan nameplate rated motor power.

TABLE 14-2 RESERVED

TABLE 14-3 RESERVED

TABLE 14-4A
Energy Efficient Electric Motors
Minimum Nominal Full-Load Efficiency

	Minimum Nominal Full-Load Efficiencies (%) before 12/19/2010					
	Open Motors			Enclosed Motors		
Number of Poles ⇒	2	4	6	2	4	6
Synchronous Speed (RPM) ⇒	3600	1800	1200	3600	1800	1200
Motor Horsepower						
1	—	82.5	80.0	75.5	82.5	80.0
1.5	82.5	84.0	84.0	82.5	84.0	85.5
2	84.0	84.0	85.5	84.0	84.0	86.5
3	84.0	86.5	86.5	85.5	87.5	87.5
5	85.5	87.5	87.5	87.5	87.5	87.5
7.5	87.5	88.5	88.5	88.5	89.5	89.5
10	88.5	89.5	90.2	89.5	89.5	89.5
15	89.2	91.0	90.2	90.2	91.0	90.2
20	90.2	91.0	91.0	90.2	91.0	90.2
25	91.0	91.7	91.7	91.0	92.4	91.7
30	91.0	92.4	92.4	91.0	92.4	91.7
40	91.7	93.0	93.0	91.7	93.0	93.0
50	92.4	93.0	93.0	92.4	93.0	93.0
60	93.0	93.6	93.6	93.0	93.6	93.6
75	93.0	94.1	93.6	93.0	94.1	93.6
100	93.0	94.1	94.1	93.6	94.5	94.1
125	93.6	94.5	94.1	94.5	94.5	94.1
150	93.6	95.0	94.5	94.5	95.0	95.0
200	94.5	95.0	94.5	95.0	95.0	95.0

Nominal efficiencies shall be established in accordance with NEMA Standard MG1. Designs A and B are National Electric Manufacturers Association (NEMA) design class designations for fixed frequency small and medium AC squirrel-cage induction motors.

TABLE 14-4B
Energy Efficient Electric Motors
Minimum Nominal Full-Load Efficiency

	Minimum Nominal Full-Load Efficiencies (%) as of 12/19/2010					
	Open Motors			Enclosed Motors		
Number of Poles ⇒	2	4	6	2	4	6
Synchronous Speed (RPM) ⇒	3600	1800	1200	3600	1800	1200
Motor Horsepower						
1	77.0	85.5	82.5	77.0	85.5	82.5
1.5	84.0	86.5	86.5	84.0	86.5	87.5

	Minimum Nominal Full-Load Efficiencies (%) as of 12/19/2010					
	Open Motors			Enclosed Motors		
Number of Poles ⇒	2	4	6	2	4	6
Synchronous Speed (RPM) ⇒	3600	1800	1200	3600	1800	1200
Motor Horsepower						
2	85.5	86.5	87.5	85.5	86.5	88.5
3	85.5	89.5	88.5	86.5	89.5	89.5
5	86.5	89.5	89.5	88.5	89.5	89.5
7.5	88.5	91.0	90.2	89.5	91.7	91.0
10	89.5	91.7	91.7	90.2	91.7	91.0
15	90.2	93.0	91.7	91.0	92.4	91.7
20	91.0	93.0	92.4	91.0	93.0	91.7
25	91.7	93.6	93.0	91.7	93.6	93.0
30	91.7	94.1	93.6	91.7	93.6	93.0
40	92.4	94.1	94.1	92.4	94.1	94.1
50	93.0	94.5	94.1	93.0	94.5	94.1
60	93.6	95.0	94.5	93.6	95.0	94.5
75	93.6	95.0	94.5	93.6	95.4	95.4
100	93.6	95.4	95.0	94.1	95.4	95.0
125	94.1	95.4	95.0	95.0	95.4	95.0
150	94.1	95.8	95.4	95.0	95.8	95.8
200	95.0	95.8	95.4	95.4	96.2	95.8
250	95.0	95.8	95.4	95.8	96.2	95.8
300	95.4	95.8	95.4	95.8	96.2	95.8
350	95.4	95.8	95.4	95.8	96.2	95.8
400	95.8	95.8	95.8	95.8	96.2	95.8
450	95.8	96.2	96.2	95.8	96.2	95.8
500	95.8	96.2	96.2	95.8	96.2	95.8

Nominal efficiencies shall be established in accordance with NEMA Standard MG1. Designs A and B are National Electric Manufacturers Association (NEMA) design class designations for fixed frequency small and medium AC squirrel-cage induction motors.

TABLE 14-5
Duct Insulation

Duct Type	Duct Location	Insulation R-Value	Other Requirements
Supply, Return	Not within conditioned space: On exterior of building, on roof, in attic, in enclosed ceiling space, in walls, in garage, in crawl spaces	R-7	Approved weather proof barrier
Outside air intake	Within conditioned space	R-7	See Section 1414.2
Supply, Return, Outside air intake	Not within conditioned space: in concrete, in ground	R-5.3	
Supply with supply air temperature < 55°F or > 105°F	Within conditioned space	R-3.3	

Note: Requirements apply to the duct type listed, whether heated or mechanically cooled. Mechanically cooled ducts requiring insulation shall have a vapor retarder, with a perm rating not greater than 0.5 and all joints sealed.

TABLE 14-6
MINIMUM PIPE INSULATION THICKNESS[1]

Fluid Design Operating Temp. Range, °F	Insulation Conductivity		Normal Pipe or Tube Size (in.)				
	Conductivity Range Btu•in./(h•ft²°F)	Mean Rating Temp. °F	<1	1 to <1-1/2	1-1/2 to <4	4 to <8	> 8
Heating systems (Steam, Steam Condensate and Hot water)[2]							
> 350	0.32-0.34	250	3.0	3.5	3.5	4.5	4.5
251-350	0.29-0.32	200	2.0	3.0	3.5	3.5	3.5
201-250	0.27-0.30	150	2.0	2.0	2.5	2.5	2.5
141-200	0.25-0.29	125	1.5	1.5	1.5	2.0	2.0
105-140	0.22-0.28	100	1.0	1.0	1.5	1.5	1.5

Fluid Design Operating Temp. Range, °F	Insulation Conductivity		Normal Pipe or Tube Size (in.)				
	Conductivity Range Btu•in./(h•ft²°F)	Mean Rating Temp. °F	<1	1 to <1-1/2	1-1/2 to <4	4 to <8	> 8
Domestic and Service Hot Water Systems							
≥105	0.22-0.28	100	1.0	1.0	1.5	1.5	1.5
Cooling Systems (Chilled Water, Brine and Refrigerant)							
40-60	0.22-0.28	100	1.0	1.0	1.5	1.5	1.5
<40	0.22-0.28	100	1.0	1.5	1.5	1.5	2.0

1. For insulation outside the stated conductivity range, the minimum thickness (T) shall be determined as follows:

$$T = r\{(1 + t/r)K/k - 1\}$$

Where:

T = Minimum insulation thickness, inches.
r = Actual outside radius of pipe, inches.
t = Insulation thickness from Table 5-12 for applicable fluid temperature and pipe size.
K = Conductivity of alternate material at the mean rating temperature indicated for the applicable fluid temperature, Btu•in(h•ft²•°F).
k = The upper value of the conductivity range listed in Table 5-12 for the applicable fluid temperature.

2. Piping insulation is not required between the control valve and coil on run-outs when the control valve is located within 4 feet of the coil and the pipe size is 1 inch or less.

[Statutory Authority: RCW 19.27A.025, 19.27A.045. 10-03-115, 10-13-113 and 10-22-056, § 51-11-1454, filed 1/20/10, 6/21/10 and 10/28/10, effective 1/1/11. Statutory Authority: RCW 19.27A.022, 19.27A.025, 19.27A.045, and chapters 19.27 and 34.05 RCW. 07-01-089, § 51-11-1454, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27A.025, 19.27A.045 and chapters 19.27, 19.27A, and 34.05 RCW. 05-01-013, § 51-11-1454, filed 12/2/04, effective 7/1/05. Statutory Authority: RCW 19.27A.025, 19.27A.045. 02-01-112, § 51-11-1454, filed 12/18/01, effective 7/1/02; 01-03-010, § 51-11-1454, filed 1/5/01, effective 7/1/01; 98-03-003, § 51-11-1454, filed 1/8/98, effective 7/1/98. Statutory Authority: RCW 19.27A.025. 93-21-052, § 51-11-1454, filed 10/18/93, effective 4/1/94.]

Reviser's note: The brackets and enclosed material in the text of the above section occurred in the copy filed by the agency.

Reviser's note: Notice of Objection: The Joint Administrative Rules Review Committee (Committee) finds that, in adopting the 2009 proposed changes to the State Energy Code, Chapter 51-11 WAC, on November 20, 2009, the State Building Code Council (Council) failed to comply with all requirements of the law and failed to adequately respond to the Committee's request for additional economic impact and cost-benefit analyses prior to adoption.

On October 1, 2009, the Committee found that the Small Business Economic Impact Statement (SBEIS) for the proposed changes filed with the Code Reviser failed to comply with all requirements of law. The Committee requested that the Council conduct a cost-benefit analysis pursuant to RCW 34.05.328 and amend the SBEIS to provide additional economic impact information, including an estimate of the number of jobs that would be created or lost as a result of compliance with all the proposed rules, as required by RCW 19.85.040 (2)(d).

The Council provided the Committee with information and data on November 18, 2009. On December 2, 2009, the Committee found that the Council failed to adequately respond to the Committee's request for additional data. Specifically, the Committee found that the Council failed to amend the SBEIS to (a) estimate the number of jobs that would be created or lost as a result of compliance with the proposed changes; and (b) support the SBEIS with a detailed and rigorous costs analysis of the cumulative impact of all the changes. In addition, the Committee found that the Council failed to provide the Committee with a cost-benefit analysis of the proposed changes and pursuant to the requirements of RCW 34.05.328.

The Committee strongly supports a process that makes thoughtful and informed progress towards changes that result in improved energy efficiency in our buildings, wherever practicable. While the Council worked diligently, it is the opinion of the Committee that the Council did not fully develop and consider the economic impacts and costs versus benefits of these significant changes to our Energy Code. Furthermore, it is the opinion of the Committee that the Council and the Legislature need this information to fully evaluate the value, impacts, and consequences of the proposed codes, with due diligence to their respective fiduciary responsibilities, in order to create the best informed public policy.

As a result, the Committee recommends that the Governor suspend the adoption and implementation of the changes to the Energy Code, Chapter 51-11 WAC, adopted by the Council on November 20, 2009, until such time as a more adequate analysis has been completed and considered by the appropriate bodies.

For all of the above stated reasons, the Committee objects to the changes to the State Energy Code, Chapter 51-11 WAC, that were adopted by the Council on November 20, 2009, and hereby directs the Code Reviser, pursuant to RCW 34.05.640(4), to publish this Notice of Objection in the Washington State Register and along with any publication in the Washington Administrative Code of changes to Chapter 51-11 WAC that were adopted by the Council in 2009 and filed with the Code Reviser.

WAC 51-11-1460 Cold storage.

1461 Refrigerated warehouse heating and cooling. Heating and cooling systems that supply cold storage spaces and frozen storage spaces in refrigerated warehouses shall meet the requirements of this section.

1462 Underslab heating. Electric resistance heat shall not be used for the purposes of underslab heating.

EXCEPTION: Underslab heating systems controlled such that the electric resistance heat is thermostatically controlled and provided with a digital input or other interface approved by the local utility that allows heat to be disabled during on-peak periods defined by the local electric utility.

1463 Evaporators. Fan-powered evaporators used in coolers and freezers shall conform to the following:

1. Single phase fan motors less than 1 hp and less than 460 volts shall be electronically commutated motors.

2. Evaporator fans shall be variable speed and the speed shall be controlled in response to space conditions.

EXCEPTION: Evaporators served by a single compressor without unloading capability.

1464 Condensers. Fan-powered condensers shall conform to the following:

1. Condensers for systems utilizing ammonia shall be evaporatively cooled.

2. Condensing temperatures for evaporative condensers under design conditions, including, but not limited to, condensers served by cooling towers shall be less than or equal to:

a. The design wetbulb temperature plus 20°F in locations where the design wetbulb temperature is less than or equal to 76°F;

b. The design wetbulb temperature plus 19°F in locations where the design wetbulb temperature is between 76°F and 78°F; or

c. The design wetbulb temperature plus 18°F in locations where the design wetbulb temperature is greater than or equal to 78°F.

3. Condensing temperatures for air-cooled condensers under design conditions shall be less than or equal to the design drybulb temperature plus 10°F for systems serving frozen storage and shall be less than or equal to the design drybulb temperature plus 15°F for systems serving cold storage.

EXCEPTION: Unitary condensing units.

4. All condenser fans for evaporative condensers shall be continuously variable speed, and the condensing temperature control system shall control the speed of all condenser fans serving a common condenser loop in unison. The minimum condensing temperature setpoint shall be less than or equal to 70°F.

5. All condenser fans for air-cooled condensers shall be continuously variable speed and the condensing temperature or pressure control system shall control the speed of all condenser fans serving a common condenser loop in unison. The minimum condensing temperature setpoint shall be less than or equal to 70°F, or reset in response to ambient drybulb temperature or refrigeration system load.

6. All single phase condenser fan motors less than 1 hp and less than 460 volts shall be either permanent split capacitor or electronically commutated motors.

1465 Compressors. Compressor systems utilized in refrigerated warehouses shall conform to the following:

1. Compressors shall be designed to operate at a minimum condensing temperature of 70°F or less.

2. The compressor speed of a screw compressor greater than 50 hp shall be controllable in response to the refrigeration load or the input power to the compressor shall be controlled to be less than or equal to 60% of full load input power when operated at 50% of full refrigeration capacity.

EXCEPTION: Refrigeration plants with more than one dedicated compressor per suction group.

[Statutory Authority: RCW 19.27A.025, 19.27A.045. 10-03-115, 10-13-113 and 10-22-056, § 51-11-1460, filed 1/20/10, 6/21/10 and 10/28/10, effective 1/1/11.]

Reviser's note: Notice of Objection: The Joint Administrative Rules Review Committee (Committee) finds that, in adopting the 2009 proposed changes to the State Energy Code, Chapter 51-11 WAC, on November 20, 2009, the State Building Code Council (Council) failed to comply with all requirements of the law and failed to adequately respond to the Committee's request for additional economic impact and cost-benefit analyses prior to adoption.

On October 1, 2009, the Committee found that the Small Business Economic Impact Statement (SBEIS) for the proposed changes filed with the Code Reviser failed to comply with all requirements of law. The Committee requested that the Council conduct a cost-benefit analysis pursuant to RCW 34.05.328 and amend the SBEIS to provide additional economic impact information, including an estimate of the number of jobs that would be created or lost as a result of compliance with all the proposed rules, as required by RCW 19.85.040 (2)(d).

The Council provided the Committee with information and data on November 18, 2009. On December 2, 2009, the Committee found that the Council failed to adequately respond to the Committee's request for additional data. Specifically, the Committee found that the Council failed to amend the SBEIS to (a) estimate the number of jobs that would be created or lost as a result of compliance with the proposed changes; and (b) support the SBEIS with a detailed and rigorous costs analysis of the cumulative impact of all the changes. In addition, the Committee found that the Council failed to provide the Committee with a cost-benefit analysis of the proposed changes and pursuant to the requirements of RCW 34.05.328.

The Committee strongly supports a process that makes thoughtful and informed progress towards changes that result in improved energy efficiency in our buildings, wherever practicable. While the Council worked diligently, it is the opinion of the Committee that the Council did not fully develop and consider the economic impacts and costs versus benefits of these significant changes to our Energy Code. Furthermore, it is the opinion of the Committee that the Council and the Legislature need this information to fully evaluate the value, impacts, and consequences of the proposed codes, with due diligence to their respective fiduciary responsibilities, in order to create the best informed public policy.

As a result, the Committee recommends that the Governor suspend the adoption and implementation of the changes to the Energy Code, Chapter 51-11 WAC, adopted by the Council on November 20, 2009, until such time as a more adequate analysis has been completed and considered by the appropriate bodies.

For all of the above stated reasons, the Committee objects to the changes to the State Energy Code, Chapter 51-11 WAC, that were adopted by the Council on November 20, 2009, and hereby directs the Code Reviser, pursuant to RCW 34.05.640(4), to publish this Notice of Objection in the Washington State Register and along with any publication in the Washington Administrative Code of changes to Chapter 51-11 WAC that were adopted by the Council in 2009 and filed with the Code Reviser.

WAC 51-11-1510 General requirements. Lighting and motors shall comply with Sections 1511 through 1514. Lighting systems shall comply with one of the following paths:

a. Prescriptive Standards:
   Interior Section 1521, or
   Exterior Section 1522.
b. Component Performance:
   Interior Section 1531, or
   Exterior Section 1532.
c. Systems Analysis. See Section 1141.4.

The compliance path selected for interior and exterior lighting need not be the same. However, interior and exterior lighting cannot be traded.

Transformers shall comply with Section 1540.

Figure 15A
Lighting, Motor and Transformer Compliance Options

Section Number	Subject	Prescriptive Option	Lighting Power Allowance Option	Systems Analysis Option
1510	General Requirements	X	X	X
1511	Electric Motors	X	X	X
1512	Exempt Lighting	X	X	X
1513	Lighting Controls	X	X	X
1514	Exit Signs	X	X	X
1520	Prescriptive Lighting Option	X		
1521	Prescriptive Interior Lighting Requirements	X		
1522	Prescriptive Exterior Lighting Requirements	Sec. 1532		
1530	Lighting Power Allowance Option		X	
1531	Interior Lighting Power Allowance		X	
1532	Exterior Lighting Power Allowance		X	
1540	Transformers	X	X	X
RS-29	Systems Analysis			X

[Statutory Authority: RCW 19.27A.025, 19.27A.045. 10-03-115, 10-13-113 and 10-22-056, § 51-11-1510, filed 1/20/10, 6/21/10 and 10/28/10, effective 1/1/11. Statutory Authority: RCW 19.27A.022, 19.27A.025, 19.27A.045, and chapters 19.27 and 34.05 RCW. 07-01-089, § 51-11-1510, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27A.025. 93-21-052, § 51-11-1510, filed 10/18/93, effective 4/1/94.]

Reviser's note: Notice of Objection: The Joint Administrative Rules Review Committee (Committee) finds that, in adopting the 2009 proposed changes to the State Energy Code, Chapter 51-11 WAC, on November 20, 2009, the State Building Code Council (Council) failed to comply with all requirements of the law and failed to adequately respond to the Committee's request for additional economic impact and cost-benefit analyses prior to adoption.

On October 1, 2009, the Committee found that the Small Business Economic Impact Statement (SBEIS) for the proposed changes filed with the Code Reviser failed to comply with all requirements of law. The Committee requested that the Council conduct a cost-benefit analysis pursuant to RCW 34.05.328 and amend the SBEIS to provide additional economic impact information, including an estimate of the number of jobs that would be created or lost as a result of compliance with all the proposed rules, as required by RCW 19.85.040 (2)(d).

The Council provided the Committee with information and data on November 18, 2009. On December 2, 2009, the Committee found that the Council failed to adequately respond to the Committee's request for additional data. Specifically, the Committee found that the Council failed to amend the SBEIS to (a) estimate the number of jobs that would be created or lost as a result of compliance with the proposed changes; and (b) support the SBEIS with a detailed and rigorous costs analysis of the cumulative impact of all the changes. In addition, the Committee found that the Council failed to provide the Committee with a cost-benefit analysis of the proposed changes and pursuant to the requirements of RCW 34.05.328.

The Committee strongly supports a process that makes thoughtful and informed progress towards changes that result in improved energy efficiency in our buildings, wherever practicable. While the Council worked diligently, it is the opinion of the Committee that the Council did not fully develop and consider the economic impacts and costs versus benefits of these significant changes to our Energy Code. Furthermore, it is the opinion of the Committee that the Council and the Legislature need this information to fully evaluate the value, impacts, and consequences of the proposed codes, with due diligence to their respective fiduciary responsibilities, in order to create the best informed public policy.

As a result, the Committee recommends that the Governor suspend the adoption and implementation of the changes to the Energy Code, Chapter 51-11 WAC, adopted by the Council on November 20, 2009, until such time as a more adequate analysis has been completed and considered by the appropriate bodies.

For all of the above stated reasons, the Committee objects to the changes to the State Energy Code, Chapter 51-11 WAC, that were adopted by the Council on November 20, 2009, and hereby directs the Code Reviser, pursuant to RCW 34.05.640(4), to publish this Notice of Objection in the Washington State Register and along with any publication in the Washington Administrative Code of changes to Chapter 51-11 WAC that were adopted by the Council in 2009 and filed with the Code Reviser.

WAC 51-11-1512 Exempt lighting. The use of these exemptions is at the applicant's option.

1512.1 Exempt Spaces: The following rooms, spaces, and areas, are exempt from the requirements in Sections 1520 through 1522 and 1530 through 1532 but shall comply with all other requirements of this chapter.

1. High risk security areas or any area identified by building officials as requiring additional lighting.
2. Spaces designed for primary use by the visually impaired, or hard of hearing (lip-reading).
3. Electrical/mechanical equipment rooms.
4. The sanctuary portion of a house of worship, defined as the space or room where the worship service takes place. Classrooms, meeting rooms, offices and multipurpose rooms that are part of the same facility are not exempt.

1512.2 Exempt Lighting Equipment: The following lighting equipment and tasks are exempt from the lighting requirements of Sections 1520 through 1522 and need not be included when calculating the installed lighting power under Sections 1530 through 1532 but shall comply with all other requirements of this chapter. All other lighting in areas that are not exempted by Section 1512.2, where exempt tasks and equipment are used, shall comply with all of the requirements of this chapter.

1. Special lighting needs for research.
2. Emergency lighting that is automatically OFF during normal building operation.
3. Lighting that is part of machines, equipment or furniture.
4. Lighting that is used solely for indoor plant growth during the hours of 10:00 p.m. to 6:00 a.m. However, such lighting shall not be exempt unless it is in addition to general area lighting, is located in a separate fixture, and is controlled by an independent control device.
5. Lighting for theatrical productions, television broadcasting (including sports facilities), and special effects lighting for stage areas and dance floors in entertain-

ment facilities. However, such lighting shall not be exempt unless it is in addition to general area lighting, is located in a separate fixture, and is controlled by an independent control device.

6. Lighting in galleries, museums and in main building entry lobbies for exhibits, inspection, and restoration. However, such lighting shall not be exempt unless it is in addition to general area lighting, is located in a separate fixture, and is controlled by an independent control device.
7. Lighting specifically designed for use during medical or dental procedures and lighting integral to medical equipment. However, such lighting shall not be exempt unless it is in addition to general area lighting, is located in a separate fixture, and is controlled by an independent control device. Use of a portion of the lamps in a multilamp fixture, provided those lamps have an independent control device, shall be permitted.
8. Lighting integral to food warming equipment or specifically for food preparation. However, such lighting shall not be exempt unless it is in addition to general area lighting, is located in a separate fixture, and is controlled by an independent control device.
9. Audio-visual and video-conferencing lighting with multilevel or dimming controls in rooms with permanently installed audio-visual equipment or video-conferencing equipment.
10. Permanently installed undershelf or undercabinet lighting that has an automatic shutoff control device integral to or is directly attached to the luminaires or is automatically controlled by a wall-mounted control device that turns off the lighting whenever that particular space is unoccupied. Other permanently installed undershelf or undercabinet lighting that is not automatically controlled is not exempt and other partition-mounted lighting that is providing general illumination is not exempt and shall be included when determining compliance with the lighting requirements of Sections 1520 through 1522 and Sections 1530 through 1532.
11. Lighting used for aircraft painting.

[Statutory Authority: RCW 19.27A.025, 19.27A.045. 10-03-115, 10-13-113 and 10-22-056, § 51-11-1512, filed 1/20/10, 6/21/10 and 10/28/10, effective 1/1/11. Statutory Authority: RCW 19.27A.022, 19.27A.025, 19.27A.045, and chapters 19.27 and 34.05 RCW. 07-01-089, § 51-11-1512, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27A.025, 19.27A.-045. 01-03-010, § 51-11-1512, filed 1/5/01, effective 7/1/01; 98-03-003, § 51-11-1512, filed 1/8/98, effective 7/1/98. Statutory Authority: RCW 19.27A.025. 93-21-052, § 51-11-1512, filed 10/18/93, effective 4/1/94.]

Reviser's note: Notice of Objection: The Joint Administrative Rules Review Committee (Committee) finds that, in adopting the 2009 proposed changes to the State Energy Code, Chapter 51-11 WAC, on November 20, 2009, the State Building Code Council (Council) failed to comply with all requirements of the law and failed to adequately respond to the Committee's request for additional economic impact and cost-benefit analyses prior to adoption.

On October 1, 2009, the Committee found that the Small Business Economic Impact Statement (SBEIS) for the proposed changes filed with the Code Reviser failed to comply with all requirements of law. The Committee requested that the Council conduct a cost-benefit analysis pursuant to RCW 34.05.328 and amend the SBEIS to provide additional economic impact information, including an estimate of the number of jobs that would be created or lost as a result of compliance with all the proposed rules, as required by RCW 19.85.040 (2)(d).

The Council provided the Committee with information and data on November 18, 2009. On December 2, 2009, the Committee found that the Council failed to adequately respond to the Committee's request for additional data. Specifically, the Committee found that the Council failed to amend the SBEIS to (a) estimate the number of jobs that would be created or lost as a result of compliance with the proposed changes; and (b) support the SBEIS with a detailed and rigorous costs analysis of the cumulative impact of all the changes. In addition, the Committee found that the Council failed to provide the Committee with a cost-benefit analysis of the proposed changes and pursuant to the requirements of RCW 34.05.328.

The Committee strongly supports a process that makes thoughtful and informed progress towards changes that result in improved energy efficiency in our buildings, wherever practicable. While the Council worked diligently, it is the opinion of the Committee that the Council did not fully develop and consider the economic impacts and costs versus benefits of these significant changes to our Energy Code. Furthermore, it is the opinion of the Committee that the Council and the Legislature need this information to fully evaluate the value, impacts, and consequences of the proposed codes, with due diligence to their respective fiduciary responsibilities, in order to create the best informed public policy.

As a result, the Committee recommends that the Governor suspend the adoption and implementation of the changes to the Energy Code, Chapter 51-11 WAC, adopted by the Council on November 20, 2009, until such time as a more adequate analysis has been completed and considered by the appropriate bodies.

For all of the above stated reasons, the Committee objects to the changes to the State Energy Code, Chapter 51-11 WAC, that were adopted by the Council on November 20, 2009, and hereby directs the Code Reviser, pursuant to RCW 34.05.640(4), to publish this Notice of Objection in the Washington State Register and along with any publication in the Washington Administrative Code of changes to Chapter 51-11 WAC that were adopted by the Council in 2009 and filed with the Code Reviser.

WAC 51-11-1513 Lighting controls. Lighting, including exempt lighting in Section 1512, shall comply with this section. Where occupancy sensors are cited, they shall have the features listed in Section 1513.6.1. Where automatic time switches are cited, they shall have the features listed in Section 1513.6.2.

1513.1 Local Control and Accessibility: Each space, enclosed by walls or ceiling-height partitions, shall be provided with lighting controls located within that space. The lighting controls, whether one or more, shall be capable of turning off all lights within the space. The controls shall be readily accessible, at the point of entry/exit, to personnel occupying or using the space.

EXCEPTIONS: The following lighting controls may be centralized in remote locations:
1. Lighting controls for spaces which must be used as a whole.
2. Automatic controls.
3. Controls requiring trained operators.
4. Controls for safety hazards and security.

1513.2 Area Controls: The maximum lighting power that may be controlled from a single switch or automatic control shall not exceed that which is provided by a twenty ampere circuit loaded to not more than eighty percent. A master control may be installed provided the individual switches retain their capability to function independently. Circuit breakers may not be used as the sole means of switching.

EXCEPTIONS: 1. Industrial or manufacturing process areas, as may be required for production.
2. Areas less than five percent of footprint for footprints over 100,000 square feet.

1513.3 Daylight Zone Control: All daylighted zones, as defined in Chapter 2, both under overhead glazing and adjacent to vertical glazing, shall be provided with individual controls, or daylight-or occupant-sensing automatic controls, which control the lights independent of general area lighting.

In all areas with skylights, monitors or other fenestration at or above ceiling level and in all areas with windows, all permanent luminaires in the daylighted zone shall be controlled by automatic daylight sensing controls. The primary

daylighted zone shall be controlled separately from the secondary daylighted zone.

Automatic daylight sensing controls shall:

1. Be capable of reducing the light output of the controlled luminaires while maintaining a uniform level of illuminance by either:

a. Continuous dimming to at least 20% light output; or

b. Step switching of each lamp in individual luminaires (noncontinuous dimming devices shall have adjustable separation (deadband) of on and off points to prevent short cycling) and provide an automatic OFF control, switching alternate luminaires is not permitted except with single lamp luminaires; or

c. Step dimming by reducing the output of all of the lamps in individual luminaires by at least 50% and provide an automatic OFF control.

2. Control only luminaires within the daylighted area.

3. Incorporate time-delay circuits to prevent cycling of light level changes of less than three minutes.

Any switching devices installed to override the automatic daylighting control shall comply with the criteria in Section 1513.6.2 items a through e.

Contiguous daylight zones adjacent to vertical glazing are allowed to be controlled by a single controlling device provided that they do not include zones facing more than two adjacent cardinal orientations (i.e., north, east, south, west). Daylight zones under overhead glazing shall be controlled separately from daylight zones adjacent to vertical glazing.

EXCEPTION: The following are exempt from the requirements for automatic daylighting controls in Section 1513.3:
1. Retail spaces adjacent to vertical glazing (retail spaces under overhead glazing are not exempt).
2. Lighting exempted by Section 1512.
3. Display, exhibition and specialty lighting complying with Section 1513.4.
4. The following spaces are exempt from the requirements for automatic daylighting controls in Section 1513.3 provided that they have occupancy sensor controls that comply with Section 1513.6.1:
a. Small spaces in the daylighted zone that are normally unoccupied (such as a storage room with a window or restrooms);
b. Rooms less than 300 square feet; and
c. Conference rooms 300 square feet and larger that have a lighting control system with at least four scene options and an occupancy sensor control that complies with Section 1513.6.1.
5. HID lamps with automatic controls that are capable of reducing the power consumption by at least 50%.
6. HID lamps 100 watts or less.

1513.4 Display, Exhibition, and Specialty Lighting Controls: All display, exhibition, or specialty lighting shall be controlled independently of general area lighting.

1513.5 Automatic Shut-Off Controls, Exterior: Lighting for all exterior applications shall have automatic controls capable of turning off exterior lighting when sufficient daylight is available or when the lighting is not required during nighttime hours. Lighting not designated for dusk-to-dawn operation shall be controlled by either:

a. A combination of a photosensor and a time switch; or

b. An astronomical time switch.

Lighting designated for dusk-to-dawn operation shall be controlled by an astronomical time switch or photosensor. All time switches shall be capable of retaining programming and the time setting during loss of power for a period of at least 10 hours.

EXCEPTION: Lighting for covered vehicle entrances or exits from buildings or parking structures where required for safety, security, or eye adaptation.

1513.6 Automatic Shut-Off Controls, Interior: All buildings shall be equipped with separate automatic controls to shut off the lighting in all spaces during unoccupied hours. Within these buildings, all office areas less than 300 ft^2 enclosed by walls or ceiling-height partitions, and all meeting and conference rooms, and all school classrooms, and warehouse and storage spaces shall be equipped with occupancy sensors that comply with Section 1513.6.1. For other spaces, automatic controls may be an occupancy sensor, time switch, or other device capable of automatically shutting off lighting. (For hotel and motel guestrooms, see Section 1513.7.)

EXCEPTIONS: 1. Areas that must be continuously illuminated (e.g., 24-hour convenience stores), or illuminated in a manner requiring manual operation of the lighting.
2. Emergency lighting and means of egress illumination as required by code that are automatically OFF during normal building operation.
3. Switching for industrial or manufacturing process facilities as may be required for production.
4. 24-hour occupancy areas in hospitals and laboratory spaces.
5. Areas in which medical or dental tasks are performed are exempt from the occupancy sensor requirement.
6. Dwelling units.

1513.6.1 Occupancy Sensors: Occupancy sensors shall be capable of automatically turning off all the lights in an area, no more than 30 minutes after the area has been vacated. Light fixtures controlled by occupancy sensors shall have a wall-mounted, manual switch capable of turning off lights when the space is occupied.

EXCEPTION: Occupancy sensors in stairwells are allowed to have two step lighting (high-light and low-light) provided the control fails in the high-light position.

1513.6.2 Automatic Time Switches: Automatic time switches shall have a minimum 7 day clock and be capable of being set for 7 different day types per week and incorporate an automatic holiday "shut-off" feature, which turns off all loads for at least 24 hours and then resumes normally scheduled operations. Automatic time switches shall also have program back-up capabilities, which prevent the loss of program and time settings for at least 10 hours, if power is interrupted.

Automatic time switches shall incorporate an over-ride switching device which:

a. Is readily accessible;
b. Is located so that a person using the device can see the lights or the areas controlled by the switch, or so that the area being illuminated is annunciated; and
c. Is manually operated;
d. Allows the lighting to remain on for no more than two hours when an over-ride is initiated; and
e. Controls an area not exceeding 5,000 square feet or 5 percent of footprint for footprints over 100,000 square feet, whichever is greater.

1513.7 Lighting Controls: Hotel and motel guest rooms and guest suites shall have a master control device at the main room entry that controls all permanently installed luminaires and switched receptacles. In addition, a minimum of one of

the following control technologies shall be required in hotel/motel guest rooms with over 50 guest rooms such that all the power to the lights and switched outlets in a hotel or motel guest room would be turned off when the occupant is not in the room:

1. Controls that are activated by the room occupant via the primary room access method - key, card, deadbolt, etc.

2. Occupancy sensor controls that are activated by the occupant's presence in the room.

1513.8 Commissioning Requirements: For lighting controls which include daylight or occupant sensing automatic controls, automatic shut-off controls, occupancy sensors, or automatic time switches, the lighting controls shall be tested to ensure that control devices, components, equipment and systems are calibrated, adjusted and operate in accordance with approved plans and specifications. Sequences of operation shall be functionally tested to ensure they operate in accordance with approved plans and specifications. See Section 1416 for complete requirements. Optional examples of test methods and forms are provided in Reference Standard 34.

[Statutory Authority: RCW 19.27A.025, 19.27A.045. 10-03-115, 10-13-113 and 10-22-056, § 51-11-1513, filed 1/20/10, 6/21/10 and 10/28/10, effective 1/1/11. Statutory Authority: RCW 19.27A.022, 19.27A.025, 19.27A.045, and chapters 19.27 and 34.05 RCW. 07-01-089, § 51-11-1513, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27A.025, 19.27A.-045 and chapters 19.27, 19.27A, and 34.05 RCW. 05-01-013, § 51-11-1513, filed 12/2/04, effective 7/1/05. Statutory Authority: RCW 19.27A.025, 19.27A.045. 01-03-010, § 51-11-1513, filed 1/5/01, effective 7/1/01. Statutory Authority: RCW 19.27A.025. 93-21-052, § 51-11-1513, filed 10/18/93, effective 4/1/94.]

Reviser's note: Notice of Objection: The Joint Administrative Rules Review Committee (Committee) finds that, in adopting the 2009 proposed changes to the State Energy Code, Chapter 51-11 WAC, on November 20, 2009, the State Building Code Council (Council) failed to comply with all requirements of the law and failed to adequately respond to the Committee's request for additional economic impact and cost-benefit analyses prior to adoption.

On October 1, 2009, the Committee found that the Small Business Economic Impact Statement (SBEIS) for the proposed changes filed with the Code Reviser failed to comply with all requirements of law. The Committee requested that the Council conduct a cost-benefit analysis pursuant to RCW 34.05.328 and amend the SBEIS to provide additional economic impact information, including an estimate of the number of jobs that would be created or lost as a result of compliance with all the proposed rules, as required by RCW 19.85.040 (2)(d).

The Council provided the Committee with information and data on November 18, 2009. On December 2, 2009, the Committee found that the Council failed to adequately respond to the Committee's request for additional data. Specifically, the Committee found that the Council failed to amend the SBEIS to (a) estimate the number of jobs that would be created or lost as a result of compliance with the proposed changes; and (b) support the SBEIS with a detailed and rigorous costs analysis of the cumulative impact of all the changes. In addition, the Committee found that the Council failed to provide the Committee with a cost-benefit analysis of the proposed changes and pursuant to the requirements of RCW 34.05.328.

The Committee strongly supports a process that makes thoughtful and informed progress towards changes that result in improved energy efficiency in our buildings, wherever practicable. While the Council worked diligently, it is the opinion of the Committee that the Council did not fully develop and consider the economic impacts and costs versus benefits of these significant changes to our Energy Code. Furthermore, it is the opinion of the Committee that the Council and the Legislature need this information to fully evaluate the value, impacts, and consequences of the proposed codes, with due diligence to their respective fiduciary responsibilities, in order to create the best informed public policy.

As a result, the Committee recommends that the Governor suspend the adoption and implementation of the changes to the Energy Code, Chapter 51-11 WAC, adopted by the Council on November 20, 2009, until such time as a more adequate analysis has been completed and considered by the appropriate bodies.

For all of the above stated reasons, the Committee objects to the changes to the State Energy Code, Chapter 51-11 WAC, that were adopted by the Council on November 20, 2009, and hereby directs the Code Reviser, pursuant to RCW 34.05.640(4), to publish this Notice of Objection in the Washington State Register and along with any publication in the Washington Administrative Code of changes to Chapter 51-11 WAC that were adopted by the Council in 2009 and filed with the Code Reviser.

WAC 51-11-1521 Prescriptive interior lighting requirements. Spaces for which the Unit Lighting Power Allowance in Table 15-1 is 0.8 watts per square foot or greater may use unlimited numbers of lighting fixtures and lighting energy, provided that the installed lighting fixtures comply with all four of the following criteria:

a. One- or two-lamp (but not three- or more lamp);

b. Luminaires have a reflector or louver assembly to direct the light (bare lamp strip or industrial fixtures do not comply with this section);

c. Fitted with type T-1, T-2, T-4, T-5, T-8 or compact fluorescent lamps from 5 to 60 watts (but not T-10 or T-12 lamps); and

d. Hard-wired fluorescent electronic dimming ballasts with photocell or programmable dimming control for all lamps in all zones (nondimming electronic ballasts and electronic ballasts that screw into medium base sockets do not comply with this section).

Track lighting is not allowed under this path.

EXCEPTIONS:
1. Up to a total of 5 percent of installed lighting fixtures may use any type of ballasted lamp and do not require dimming controls.
2. Clear safety lenses are allowed in food prep and serving areas and patient care areas in otherwise compliant fixtures.
3. LED lights.
4. Metal halide lighting which complies with all three of the following criteria:
i. Luminaires or lamps which have a reflector or louver assembly to direct the light;
ii. Fixtures are fitted with ceramic metal halide lamps not exceeding 150 watts; and
iii. Electronic ballasts.

[Statutory Authority: RCW 19.27A.025, 19.27A.045. 10-03-115, 10-13-113 and 10-22-056, § 51-11-1521, filed 1/20/10, 6/21/10 and 10/28/10, effective 1/1/11. Statutory Authority: RCW 19.27A.022, 19.27A.025, 19.27A.045, and chapters 19.27 and 34.05 RCW. 07-01-089, § 51-11-1521, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27A.025, 19.27A.-045 and chapters 19.27, 19.27A, and 34.05 RCW. 05-01-013, § 51-11-1521, filed 12/2/04, effective 7/1/05. Statutory Authority: RCW 19.27A.025, 19.27A.045. 01-03-010, § 51-11-1521, filed 1/5/01, effective 7/1/01. Statutory Authority: RCW 19.27A.025. 93-21-052, § 51-11-1521, filed 10/18/93, effective 4/1/94.]

Reviser's note: Notice of Objection: The Joint Administrative Rules Review Committee (Committee) finds that, in adopting the 2009 proposed changes to the State Energy Code, Chapter 51-11 WAC, on November 20, 2009, the State Building Code Council (Council) failed to comply with all requirements of the law and failed to adequately respond to the Committee's request for additional economic impact and cost-benefit analyses prior to adoption.

On October 1, 2009, the Committee found that the Small Business Economic Impact Statement (SBEIS) for the proposed changes filed with the Code Reviser failed to comply with all requirements of law. The Committee requested that the Council conduct a cost-benefit analysis pursuant to RCW 34.05.328 and amend the SBEIS to provide additional economic impact information, including an estimate of the number of jobs that would be created or lost as a result of compliance with all the proposed rules, as required by RCW 19.85.040 (2)(d).

The Council provided the Committee with information and data on November 18, 2009. On December 2, 2009, the Committee found that the

Council failed to adequately respond to the Committee's request for additional data. Specifically, the Committee found that the Council failed to amend the SBEIS to (a) estimate the number of jobs that would be created or lost as a result of compliance with the proposed changes; and (b) support the SBEIS with a detailed and rigorous costs analysis of the cumulative impact of all the changes. In addition, the Committee found that the Council failed to provide the Committee with a cost-benefit analysis of the proposed changes and pursuant to the requirements of RCW 34.05.328.

The Committee strongly supports a process that makes thoughtful and informed progress towards changes that result in improved energy efficiency in our buildings, wherever practicable. While the Council worked diligently, it is the opinion of the Committee that the Council did not fully develop and consider the economic impacts and costs versus benefits of these significant changes to our Energy Code. Furthermore, it is the opinion of the Committee that the Council and the Legislature need this information to fully evaluate the value, impacts, and consequences of the proposed codes, with due diligence to their respective fiduciary responsibilities, in order to create the best informed public policy.

As a result, the Committee recommends that the Governor suspend the adoption and implementation of the changes to the Energy Code, Chapter 51-11 WAC, adopted by the Council on November 20, 2009, until such time as a more adequate analysis has been completed and considered by the appropriate bodies.

For all of the above stated reasons, the Committee objects to the changes to the State Energy Code, Chapter 51-11 WAC, that were adopted by the Council on November 20, 2009, and hereby directs the Code Reviser, pursuant to RCW 34.05.640(4), to publish this Notice of Objection in the Washington State Register and along with any publication in the Washington Administrative Code of changes to Chapter 51-11 WAC that were adopted by the Council in 2009 and filed with the Code Reviser.

WAC 51-11-1530 Lighting power allowance option. The installed lighting wattage shall not exceed the lighting power allowance. Lighting wattage includes lamp and ballast wattage.

Luminaire wattage incorporated into the installed interior and exterior lighting power shall be determined in accordance with the following criteria:

a. The wattage of line-voltage incandescent or tungsten-halogen luminaires not containing permanently installed ballasts shall be the maximum labeled wattage of the luminaire.

b. The wattage of luminaires with permanently installed or remote ballasts or transformers shall be the operating input wattage of the maximum lamp/auxiliary combination based on values from the auxiliary manufacturer's literature or recognized testing laboratories or shall be the maximum labeled wattage of the luminaire.

c. For line voltage track and plugin busway, designed to allow the addition and/or relocation of luminaires without altering the wiring of the system, the wattage shall be:

1. The specified wattage of the luminaires included in the system with a minimum of 50 watts per lineal foot of track or actual luminaire wattage, whichever is greater, or

2. The wattage limit of permanent current limiting device(s) on the system.

d. The wattage of low-voltage lighting track, cable conductor, rail conductor, and other flexible lighting systems that allow the addition and/or relocation of luminaires without altering the wiring of the system shall be the specified wattage of the transformer supplying the system.

e. The wattage of all other miscellaneous lighting equipment shall be the specified wattage of the lighting equipment.

No credit towards compliance with the lighting power allowances shall be given for the use of any controls, automatic or otherwise.

[Statutory Authority: RCW 19.27A.025, 19.27A.045. 10-03-115, 10-13-113 and 10-22-056, § 51-11-1530, filed 1/20/10, 6/21/10 and 10/28/10, effective 1/1/11. Statutory Authority: RCW 19.27A.022, 19.27A.025, 19.27A.045, and chapters 19.27 and 34.05 RCW. 07-01-089, § 51-11-1530, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27A.025, 19.27A.-045. 01-03-010, § 51-11-1530, filed 1/5/01, effective 7/1/01; 98-03-003, § 51-11-1530, filed 1/8/98, effective 7/1/98. Statutory Authority: RCW 19.27A.025. 93-21-052, § 51-11-1530, filed 10/18/93, effective 4/1/94.]

Reviser's note: Notice of Objection: The Joint Administrative Rules Review Committee (Committee) finds that, in adopting the 2009 proposed changes to the State Energy Code, Chapter 51-11 WAC, on November 20, 2009, the State Building Code Council (Council) failed to comply with all requirements of the law and failed to adequately respond to the Committee's request for additional economic impact and cost-benefit analyses prior to adoption.

On October 1, 2009, the Committee found that the Small Business Economic Impact Statement (SBEIS) for the proposed changes filed with the Code Reviser failed to comply with all requirements of law. The Committee requested that the Council conduct a cost-benefit analysis pursuant to RCW 34.05.328 and amend the SBEIS to provide additional economic impact information, including an estimate of the number of jobs that would be created or lost as a result of compliance with all the proposed rules, as required by RCW 19.85.040 (2)(d).

The Council provided the Committee with information and data on November 18, 2009. On December 2, 2009, the Committee found that the Council failed to adequately respond to the Committee's request for additional data. Specifically, the Committee found that the Council failed to amend the SBEIS to (a) estimate the number of jobs that would be created or lost as a result of compliance with the proposed changes; and (b) support the SBEIS with a detailed and rigorous costs analysis of the cumulative impact of all the changes. In addition, the Committee found that the Council failed to provide the Committee with a cost-benefit analysis of the proposed changes and pursuant to the requirements of RCW 34.05.328.

The Committee strongly supports a process that makes thoughtful and informed progress towards changes that result in improved energy efficiency in our buildings, wherever practicable. While the Council worked diligently, it is the opinion of the Committee that the Council did not fully develop and consider the economic impacts and costs versus benefits of these significant changes to our Energy Code. Furthermore, it is the opinion of the Committee that the Council and the Legislature need this information to fully evaluate the value, impacts, and consequences of the proposed codes, with due diligence to their respective fiduciary responsibilities, in order to create the best informed public policy.

As a result, the Committee recommends that the Governor suspend the adoption and implementation of the changes to the Energy Code, Chapter 51-11 WAC, adopted by the Council on November 20, 2009, until such time as a more adequate analysis has been completed and considered by the appropriate bodies.

For all of the above stated reasons, the Committee objects to the changes to the State Energy Code, Chapter 51-11 WAC, that were adopted by the Council on November 20, 2009, and hereby directs the Code Reviser, pursuant to RCW 34.05.640(4), to publish this Notice of Objection in the Washington State Register and along with any publication in the Washington Administrative Code of changes to Chapter 51-11 WAC that were adopted by the Council in 2009 and filed with the Code Reviser.

WAC 51-11-1531 Interior lighting power allowance. The interior lighting power allowance shall be calculated by multiplying the gross interior floor area, in square feet, by the appropriate unit lighting power allowance, in watts per square foot, for the use as specified in Table 15-1. Accessory uses, including corridors, lobbies and toilet facilities shall be included with the primary use.

The lighting power allowance for each use shall be separately calculated and summed to obtain the interior lighting power allowance.

In cases where a lighting plan for only a portion of a building is submitted, the interior lighting power allowance shall be based on the gross interior floor area covered by the plan. Plans submitted for common areas only, including cor-

ridors, lobbies and toilet facilities shall use the lighting power allowance for common areas in Table 15-1.

When insufficient information is known about the specific use of the space, the allowance shall be based on the apparent intended use of the space.

[Statutory Authority: RCW 19.27A.025, 19.27A.045. 10-03-115, 10-13-113 and 10-22-056, § 51-11-1531, filed 1/20/10, 6/21/10 and 10/28/10, effective 1/1/11; 01-03-010, § 51-11-1531, filed 1/5/01, effective 7/1/01. Statutory Authority: RCW 19.27A.025. 93-21-052, § 51-11-1531, filed 10/18/93, effective 4/1/94.]

Reviser's note: Notice of Objection: The Joint Administrative Rules Review Committee (Committee) finds that, in adopting the 2009 proposed changes to the State Energy Code, Chapter 51-11 WAC, on November 20, 2009, the State Building Code Council (Council) failed to comply with all requirements of the law and failed to adequately respond to the Committee's request for additional economic impact and cost-benefit analyses prior to adoption.

On October 1, 2009, the Committee found that the Small Business Economic Impact Statement (SBEIS) for the proposed changes filed with the Code Reviser failed to comply with all requirements of law. The Committee requested that the Council conduct a cost-benefit analysis pursuant to RCW 34.05.328 and amend the SBEIS to provide additional economic impact information, including an estimate of the number of jobs that would be created or lost as a result of compliance with all the proposed rules, as required by RCW 19.85.040 (2)(d).

The Council provided the Committee with information and data on November 18, 2009. On December 2, 2009, the Committee found that the Council failed to adequately respond to the Committee's request for additional data. Specifically, the Committee found that the Council failed to amend the SBEIS to (a) estimate the number of jobs that would be created or lost as a result of compliance with the proposed changes; and (b) support the SBEIS with a detailed and rigorous costs analysis of the cumulative impact of all the changes. In addition, the Committee found that the Council failed to provide the Committee with a cost-benefit analysis of the proposed changes and pursuant to the requirements of RCW 34.05.328.

The Committee strongly supports a process that makes thoughtful and informed progress towards changes that result in improved energy efficiency in our buildings, wherever practicable. While the Council worked diligently, it is the opinion of the Committee that the Council did not fully develop and consider the economic impacts and costs versus benefits of these significant changes to our Energy Code. Furthermore, it is the opinion of the Committee that the Council and the Legislature need this information to fully evaluate the value, impacts, and consequences of the proposed codes, with due diligence to their respective fiduciary responsibilities, in order to create the best informed public policy.

As a result, the Committee recommends that the Governor suspend the adoption and implementation of the changes to the Energy Code, Chapter 51-11 WAC, adopted by the Council on November 20, 2009, until such time as a more adequate analysis has been completed and considered by the appropriate bodies.

For all of the above stated reasons, the Committee objects to the changes to the State Energy Code, Chapter 51-11 WAC, that were adopted by the Council on November 20, 2009, and hereby directs the Code Reviser, pursuant to RCW 34.05.640(4), to publish this Notice of Objection in the Washington State Register and along with any publication in the Washington Administrative Code of changes to Chapter 51-11 WAC that were adopted by the Council in 2009 and filed with the Code Reviser.

WAC 51-11-1532 Exterior lighting power allowance. All exterior building grounds luminaires that operate at greater than 100 watts shall contain lamps having a minimum efficacy of 60 lm/W unless the luminaire is controlled by a motion sensor or qualifies for one of the following exceptions.

The total exterior lighting power allowance for all exterior building applications is the sum of the base site allowance plus the individual allowances for areas that are designated on the buildings plans to be illuminated and are permitted in Table 15-2B for the applicable lighting zone. Tradeoffs are allowed only among exterior lighting applications listed in the Table 15-2B "Tradable Surfaces" section. The lighting zone for building exterior is determined from Table 15-2A unless otherwise specified by the local jurisdiction.

EXCEPTION: Lighting used for the following exterior applications is exempt when equipped with a control device independent of the control of the nonexempt lighting:

a. Specialized signal, directional, and marker lighting associated with transportation.

b. Lighting integral to signs.

c. Lighting integral to equipment or instrumentation and installed by its manufacturer.

d. Lighting for theatrical purposes, including performance, stage, film production, and video production.

e. Lighting for athletic playing areas.

f. Temporary lighting.

g. Lighting for industrial production.

h. Theme elements in theme/amusement parks.

i. Lighting used to highlight features of public monuments.

j. Group U Occupancy accessory to Group R-3 or R-4 Occupancy.

1540 Transformers. The minimum efficiency of a low voltage dry-type distribution transformer shall be the Class I Efficiency Levels for distribution transformers specified in Table 4-2 of the "Guide for Determining Energy Efficiency for Distribution Transformers" published by the National Electrical Manufacturers Association (NEMA TP-1-2002).

TABLE 15-1
Unit Lighting Power Allowance (LPA)

Use[1]	**LPA[2] (watts/sq. ft.)**
Automotive facility	0.85
Convention center	1.10
Court house	1.10
Cafeterias, fast food establishments[5], restaurants/bars[5]	1.20
Dormitory	0.85
Dwelling units	1.00
Exercise center	0.95
Gymnasia, assembly spaces	0.95
Health care clinic	1.00
Hospital, nursing homes, and other Group I-1 and I-2 Occupancies	1.20
Hotel/motel	1.00
Laboratory spaces (all spaces not classified "laboratory" shall meet office and other appropriate categories)	1.62
Laundries	1.20
Libraries[5]	1.20
Manufacturing facility	1.20
Museum	1.00
Office buildings, office/administrative areas in facilities of other use types (including but not limited to schools, hospitals, institutions, museums, banks, churches)[5]	0.91
Parking garages	0.20
Penitentiary and other Group I-3 Occupancies	0.90
Police and fire stations	0.90
Post office	1.00
Retail[10], retail banking, mall concourses, wholesale stores (pallet rack shelving)	1.33
School buildings (Group E Occupancy only), school classrooms, day care centers	1.00
Theater, motion picture	0.97
Theater, performing arts	1.25
Transportation	0.80
Warehouses	0.50
Workshop	1.20
Plans Submitted for Common Areas Only[7]	
Main floor building lobbies[3] (except mall concourses)	1.10

Use[1]	LPA[2] (watts/sq. ft.)
All building common areas, corridors, toilet facilities and washrooms, elevator lobbies, including Group R-1 and R-2 Occupancies	0.80

Footnotes for Table 15-1

1. In cases in which a general use and a specific use are listed, the specific use shall apply. In cases in which a use is not mentioned specifically, the *Unit Power Allowance* shall be determined by the building official. This determination shall be based upon the most comparable use specified in the table. See Section 1512 for exempt areas.
2. The watts per square foot may be increased, by two percent per foot of ceiling height above twenty feet, unless specifically directed otherwise by subsequent footnotes.
3. Watts per square foot of room may be increased by two percent per foot of ceiling height above twelve feet.
4. For all other spaces, such as seating and common areas, use the *Unit Light Power Allowance* for assembly.
5. Watts per square foot of room may be increased by two percent per foot of ceiling height above nine feet.
6. Reserved.
7. For conference rooms and offices less than 150 ft^2 with full-height partitions, a *Unit Lighting Power Allowance* of 1.1 W/ft^2 may be used.
8. Reserved.
9. For indoor sport tournament courts with adjacent spectator seating over 5,000, the *Unit Lighting Power Allowance* for the court area is 2.6 watts per square foot.
10. Display window illumination installed within 2 feet of the window, provided that the display window is separated from the retail space by walls or at least three-quarter-height partitions (transparent or opaque) and lighting for free-standing display where the lighting moves with the display are exempt.
    An additional lighting power allowance is allowed for merchandise display luminaires installed in retail sales area that are specifically designed and directed to highlight merchandise. The following additional wattages apply:

    i. 0.6 watts per square foot of sales floor area not listed in items ii or iii below;

    ii. 1.4 watts per square foot of furniture, clothing, cosmetics or artwork floor area; or

    iii. 2.5 watts per square foot of jewelry, crystal, or china floor area.

    The specified floor area for items i, ii, or iii above, and the adjoining circulation paths shall be identified and specified on building plans. Calculate the additional power allowance by multiplying the above LPDs by the sales floor area for each department excluding major circulation paths. The total additional lighting power allowance is the sum of allowances for sales categories i, ii, or iii plus an additional 1,000 watts for each separate tenant larger than 250 square feet in area.

    The additional wattage is allowed only if the merchandise display luminaires comply with all of the following:

    (a) Located on ceiling-mounted track or directly on or recessed into the ceiling itself (not on the wall).

    (b) Adjustable in both the horizontal and vertical axes (vertical axis only is acceptable for fluorescent and other fixtures with two points of track attachment).

    This additional lighting power is allowed only if the lighting is actually installed and automatically controlled, separately from the general lighting, to be turned off during nonbusiness hours. This additional power shall be used only for the specified luminaires and shall not be used for any other purpose.
11. Provided that a floor plan, indicating rack location and height, is submitted, the square footage for a warehouse may be defined, for computing the interior *Unit Lighting Power Allowance*, as the floor area not covered by racks plus the vertical face area (access side only) of the racks. The height allowance defined in footnote 2 applies only to the floor area not covered by racks.

TABLE 15-2A
Exterior Lighting Zones

Lighting Zone	Description
1	Developed areas of national parks, state parks, forest
2	Areas predominantly consisting of residential zoning, neighborhood business districts, light industrial with limited nighttime use and residential mixed areas
3	All other areas
4	High activity commercial districts in major metropolitan areas as designated by the local jurisdiction

TABLE 15-2B
Lighting Power Densities for Building Exteriors

	Specific area description	Zone 1	Zone 2	Zone 3	Zone 4
Base site allowance[1]		500 W	600 W	750 W	1300 W
Tradable Surfaces [2]					
Uncovered Parking Areas	Parking areas and drives	0.04 W/ft^2	0.06 W/ft^2	0.10 W/ft^2	0.13 W/ft^2
Building Grounds	Walkways less than 10 ft wide	0.7 W/linear foot	0.7 W/linear foot	0.8 W/linear foot	1.0 W/linear foot
	Walkways 10 ft wide or greater, Plaza areas, Special feature areas	0.14 W/ft^2	0.14 W/ft^2	0.16 W/ft^2	0.2 W/ft^2

Specific area description		Zone 1	Zone 2	Zone 3	Zone 4
Base site allowance[1]		500 W	600 W	750 W	1300 W
Tradable Surfaces [2]					
	Exterior stairways	0.75 W/ft^2	1.0 W/ft^2	1.0 W/ft^2	1.0 W/ft^2
	Pedestrian tunnel	0.15 W/ft^2	0.15 W/ft^2	0.2 W/ft^2	0.3 W/ft^2
	Landscaping	0.04 W/ft^2	0.05 W/ft^2	0.05 W/ft^2	0.05 W/ft^2
Building Entrances and Exits	Main entries	20 W/linear foot of door width	20 W/linear foot of door width	30 W/linear foot of door width	30 W/linear foot of door width
	Other doors	20 W/linear foot of door width	20 W/linear foot of door width	20 W/linear foot of door width	20 W/linear foot of door width
	Entry canopies	0.25 W/ft^2	0.25 W/ft^2	0.4 W/ft^2	0.4 W/ft^2
Sales Canopies	Free standing and attached	0.6 W/ft^2	0.6 W/ft^2	0.8 W/ft^2	1.0 W/ft^2
Outdoor Sales	Open areas[3]	0.25 W/ft^2	0.25 W/ft^2	0.5 W/ft^2	0.7 W/ft^2
	Street frontage for vehicle sales lots in addition to "open area" allowance	No Allowance	10 W/linear foot	10 W/linear foot	30 W/linear foot
Nontradable Surfaces[4]					
Building Facades		No Allowance	0.1 W/ft^2 for each illuminated wall or surface[5]	0.15 W/ft^2 for each illuminated wall or surface[6]	0.2 W/ft^2 for each illuminated wall or surface[7]
Automated Teller Machines and Night Depositories		270 W per location[8]	270 W per location[8]	270 W per location[8]	270 W per location[8]
Entrances and Gatehouse Inspection Stations at Guarded Facilities		0.75 W/ft^2 of covered and uncovered area	0.75 W/ft^2 of covered and uncovered area	0.75 W/ft^2 of covered and uncovered area	0.75 W/ft^2 of covered and uncovered area
Loading Areas for Law Enforcement, Fire, Ambulance and Other Emergency Service Vehicles		0.5 W/ft^2 of covered and uncovered area	0.5 W/ft^2 of covered and uncovered area	0.5 W/ft^2 of covered and uncovered area	0.5 W/ft^2 of covered and uncovered area
Material Handling and Associated Storage					0.5 W/ft^2
Drive-up Windows and Doors		400 W per drive-through	400 W per drive-through	400 W per drive-through	400 W per drive-through
Parking Near 24-hour Retail Entrances		800 W per main entry	800 W per main entry	800 W per main entry	800 W per main entry

FOOTNOTES FOR TABLE 15-2B:

1. Base site allowance may be used in tradable or nontradable surfaces.
2. Lighting power densities for uncovered parking areas, building grounds, building entrances and exits, canopies and overhangs and outdoor sales areas may be traded.
3. Including vehicle sales lots.
4. Lighting power density calculations for the following applications can be used only for the specific application and cannot be traded between surfaces or with other exterior lighting. The following allowances are in addition to any allowance otherwise permitted in the "Tradable Surfaces" section of this table.
5. May alternately use 2.5 watts per linear foot for each wall or surface length.
6. May alternately use 3.75 watts per linear foot for each wall or surface length.
7. May alternately use 5 watts per linear foot for each wall or surface length.
8. An additional 90 watts is allowed per additional ATM location.

[Statutory Authority: RCW 19.27A.025, 19.27A.045. 10-03-115, 10-13-113 and 10-22-056, § 51-11-1532, filed 1/20/10, 6/21/10 and 10/28/10, effective 1/1/11. Statutory Authority: RCW 19.27A.022, 19.27A.025, 19.27A.045, and chapters 19.27 and 34.05 RCW. 07-01-089, § 51-11-1532, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27A.025, 19.27A.045 and chapters 19.27, 19.27A, and 34.05 RCW. 05-01-013, § 51-11-1532, filed 12/2/04, effective 7/1/05. Statutory Authority: RCW 19.27A.020, 19.27A.045. 04-01-106, § 51-11-1532, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27A.025, 19.27A.045. 01-03-010, § 51-11-1532, filed 1/5/01, effective 7/1/01. Statutory Authority: RCW 19.27A.025. 93-21-052, § 51-11-1532, filed 10/18/93, effective 4/1/94.]

Reviser's note: Notice of Objection: The Joint Administrative Rules Review Committee (Committee) finds that, in adopting the 2009 proposed changes to the State Energy Code, Chapter 51-11 WAC, on November 20, 2009, the State Building Code Council (Council) failed to comply with all requirements of the law and failed to adequately respond to the Committee's request for additional economic impact and cost-benefit analyses prior to adoption.

On October 1, 2009, the Committee found that the Small Business Economic Impact Statement (SBEIS) for the proposed changes filed with the Code Reviser failed to comply with all requirements of law. The Committee requested that the Council conduct a cost-benefit analysis pursuant to RCW 34.05.328 and amend the SBEIS to provide additional economic impact information, including an estimate of the number of jobs that would be created or lost as a result of compliance with all the proposed rules, as required by RCW 19.85.040 (2)(d).

The Council provided the Committee with information and data on November 18, 2009. On December 2, 2009, the Committee found that the Council failed to adequately respond to the Committee's request for additional data. Specifically, the Committee found that the Council failed to amend the SBEIS to (a) estimate the number of jobs that would be created or lost as a result of compliance with the proposed changes; and (b) support the SBEIS with a detailed and rigorous costs analysis of the cumulative impact of all the changes. In addition, the Committee found that the Council failed to provide the Committee with a cost-benefit analysis of the proposed changes and pursuant to the requirements of RCW 34.05.328.

The Committee strongly supports a process that makes thoughtful and informed progress towards changes that result in improved energy efficiency in our buildings, wherever practicable. While the Council worked diligently, it is the opinion of the Committee that the Council did not fully develop and consider the economic impacts and costs versus benefits of these significant changes to our Energy Code. Furthermore, it is the opinion of the Committee that the Council and the Legislature need this information to fully evaluate the value, impacts, and consequences of the proposed codes, with due diligence to their respective fiduciary responsibilities, in order to create the best informed public policy.

As a result, the Committee recommends that the Governor suspend the adoption and implementation of the changes to the Energy Code, Chapter 51-11 WAC, adopted by the Council on November 20, 2009, until such time as a more adequate analysis has been completed and considered by the appropriate bodies.

For all of the above stated reasons, the Committee objects to the changes to the State Energy Code, Chapter 51-11 WAC, that were adopted by the Council on November 20, 2009, and hereby directs the Code Reviser, pursuant to RCW 34.05.640(4), to publish this Notice of Objection in the Washington State Register and along with any publication in the Washington Administrative Code of changes to Chapter 51-11 WAC that were adopted by the Council in 2009 and filed with the Code Reviser.

WAC 51-11-99901 Section 1—General.

Note: Washington State Energy Code Reference Standard 29 (RS-29) is a modified version of Appendix G from ASHRAE/ IESNA Standard 90.1-2007.

The following definitions apply to use of RS-29:

Baseline building design: A computer representation of a hypothetical design based on the proposed building project. This representation is used as the basis for calculating the baseline building performance for rating above-standard design.

Baseline building performance: The annual energy consumption for a building design intended for use as a baseline for rating above-standard design.

Proposed building performance: The annual energy consumption calculated for a proposed design.

Proposed design: A computer representation of the actual proposed building design or portion thereof used as the basis for calculating the proposed building performance.

1.1 General: This Standard establishes design criteria in terms of total energy consumption of a building, including all of its systems.

The building permit application for projects utilizing this Standard shall include in one submittal all building and mechanical drawings and all information necessary to verify that the building envelope and mechanical design for the project corresponds with the annual energy analysis. If credit is proposed to be taken for lighting energy savings, then an electrical permit application shall also be submitted and approved prior to the issuance of the building permit. If credit is proposed to be taken for energy savings from other components, then the corresponding permit application (e.g., plumbing, boiler, etc.) shall also be submitted and approved prior to the building permit application. Otherwise, components of the project that would not be approved as part of a building permit application shall be modeled the same in both the proposed building and the baseline building and shall comply with the requirements of the Washington State Energy Code.

1.2 Performance Rating. This performance rating method requires conformance with the following provisions:

All requirements of Sections 1201 through 1202, 1310 through 1314, 1410 through 1416, 1440 through 1446, 1450 through 1455, 1460 through 1465, 1510 through 1514, and 1540 are met. These sections contain the mandatory provisions of the standard and are prerequisites for this rating method. The improved performance of the proposed building design is calculated in accordance with provisions of this appendix using the following formula:

Percentage improvement = 100 x (Baseline building performance - Proposed building performance) / Baseline building performance

A "proposed building" designed in accordance with this standard will be deemed as complying with this Code, if the calculated annual energy consumption is 5% LESS than that of a corresponding "baseline building."

Notes: 1. Both the proposed building performance and the baseline building performance shall include all end-use load components, such as receptacle and process loads.
2. Neither the proposed building performance nor the baseline building performance are predictions of actual energy consumption or costs for the proposed design after construction. Actual experience will differ from these calculations due to variations such as occupancy, building operation and maintenance, weather, energy use not covered by this procedure, changes in energy rates between design of the building and occupancy, and the precision of the calculation tool.

1.3 Trade-Off Limits. When the proposed modifications apply to less than the whole building, only parameters related to the systems to be modified shall be allowed to vary. Parameters relating to unmodified existing conditions or to future building components shall be identical for determining both the baseline building performance and the proposed building performance. Future building components shall meet the requirements of Sections 1320 through 1334, 1420 through 1439, and 1530 through 1532.

1.4 Documentation Requirements. Simulated performance shall be documented, and documentation shall be submitted to the building official. The information submitted shall include the following:

a. Calculated values for the baseline building performance, the proposed building performance, and the percentage improvement.

b. A list of the energy-related features that are included in the design and on which the performance rating is based. This list shall document all energy features that differ between the models used in the baseline building performance and proposed building performance calculations.

c. Input and output report(s) from the simulation program or compliance software including a breakdown of energy usage by at least the following components: Lights, internal equipment loads, service water heating equipment, space heating equipment, space cooling and heat rejection equipment, fans, and other HVAC equipment (such as pumps). The output reports shall also show the amount of time any loads are not met by the HVAC system for both the proposed design and baseline building design.

d. An explanation of any error messages noted in the simulation program output.

[Statutory Authority: RCW 19.27A.025, 19.27A.045. 10-03-115, 10-13-113 and 10-22-056, § 51-11-99901, filed 1/20/10, 6/21/10 and 10/28/10, effective 1/1/11. Statutory Authority: RCW 19.27A.025. 93-21-052, § 51-11-99901, filed 10/18/93, effective 4/1/94.]

Reviser's note: Notice of Objection: The Joint Administrative Rules Review Committee (Committee) finds that, in adopting the 2009 proposed changes to the State Energy Code, Chapter 51-11 WAC, on November 20, 2009, the State Building Code Council (Council) failed to comply with all requirements of the law and failed to adequately respond to the Committee's request for additional economic impact and cost-benefit analyses prior to adoption.

On October 1, 2009, the Committee found that the Small Business Economic Impact Statement (SBEIS) for the proposed changes filed with the Code Reviser failed to comply with all requirements of law. The Committee requested that the Council conduct a cost-benefit analysis pursuant to RCW 34.05.328 and amend the SBEIS to provide additional economic impact information, including an estimate of the number of jobs that would be created or lost as a result of compliance with all the proposed rules, as required by RCW 19.85.040 (2)(d).

The Council provided the Committee with information and data on November 18, 2009. On December 2, 2009, the Committee found that the Council failed to adequately respond to the Committee's request for additional data. Specifically, the Committee found that the Council failed to amend the SBEIS to (a) estimate the number of jobs that would be created or

lost as a result of compliance with the proposed changes; and (b) support the SBEIS with a detailed and rigorous costs analysis of the cumulative impact of all the changes. In addition, the Committee found that the Council failed to provide the Committee with a cost-benefit analysis of the proposed changes and pursuant to the requirements of RCW 34.05.328.

The Committee strongly supports a process that makes thoughtful and informed progress towards changes that result in improved energy efficiency in our buildings, wherever practicable. While the Council worked diligently, it is the opinion of the Committee that the Council did not fully develop and consider the economic impacts and costs versus benefits of these significant changes to our Energy Code. Furthermore, it is the opinion of the Committee that the Council and the Legislature need this information to fully evaluate the value, impacts, and consequences of the proposed codes, with due diligence to their respective fiduciary responsibilities, in order to create the best informed public policy.

As a result, the Committee recommends that the Governor suspend the adoption and implementation of the changes to the Energy Code, Chapter 51-11 WAC, adopted by the Council on November 20, 2009, until such time as a more adequate analysis has been completed and considered by the appropriate bodies.

For all of the above stated reasons, the Committee objects to the changes to the State Energy Code, Chapter 51-11 WAC, that were adopted by the Council on November 20, 2009, and hereby directs the Code Reviser, pursuant to RCW 34.05.640(4), to publish this Notice of Objection in the Washington State Register and along with any publication in the Washington Administrative Code of changes to Chapter 51-11 WAC that were adopted by the Council in 2009 and filed with the Code Reviser.

WAC 51-11-99902 Section 2—Simulation general requirements.

2.1 Performance Calculations. The proposed building performance and baseline building performance shall be calculated using the following:

a. The same simulation program.

b. The same weather data.

2.2 Simulation Program. The simulation program shall be a computer-based program for the analysis of energy consumption in buildings (a program such as, but not limited to, DOE-2, BLAST, or EnergyPlus). The simulation program shall include calculation methodologies for the building components being modeled. For components that cannot be modeled by the simulation program, the exceptional calculation methods requirements in Section 2.5 may be used.

2.2.1 The simulation program shall be approved by the building official and shall, at a minimum, have the ability to explicitly model all of the following:

a. 8760 hours per year.

b. Hourly variations in occupancy, lighting power, miscellaneous equipment power, thermostat set points, and HVAC system operation, defined separately for each day of the week and holidays.

c. Thermal mass effects.

d. Ten or more thermal zones.

e. Part-load performance curves for mechanical equipment.

f. Capacity and efficiency correction curves for mechanical heating and cooling equipment.

g. Air-side economizers with integrated control.

h. Baseline building design characteristics specified in Section 3.

2.2.2 The simulation program shall have the ability to either: (1) Directly determine the proposed building performance and baseline building performance; or (2) produce hourly reports of energy use by an energy source suitable for determining the proposed building performance and baseline building performance using a separate calculation engine.

2.2.3 The simulation program shall be capable of performing design load calculations to determine required HVAC equipment capacities and air and water flow rates in accordance with generally accepted engineering standards and handbooks (for example, ASHRAE Handbook-Fundamentals) for both the proposed design and baseline building design.

2.2.4 The simulation program shall be tested according to ASHRAE Standard 140.

2.3 Climatic Data. The simulation program shall perform the simulation using hourly values of climatic data, such as temperature and humidity from representative climatic data, for the site in which the proposed design is to be located. For cities or urban regions with several climatic data entries, and for locations where weather data are not available, the designer shall select available weather data that best represent the climate at the construction site. The selected weather data shall be approved by the building official.

2.4 Energy Conversion. The comparison between the baseline building and proposed design shall be expressed as kBtu input per square foot of conditioned floor area per year at the building site. Buildings which use electricity as the only fuel source, comparisons may be expressed in kWh. When converting electricity in kWh to kBtu a multiplier of 3.413 kWh/kBtu shall be used.

EXCEPTION: On-site renewable energy sources or site-recovered energy shall not be considered to be consumed energy and shall not be included in the proposed building performance. Where on-site renewable or site-recovered sources are used, the baseline building performance shall be based on the energy source used as the backup energy source or on the use of electricity if no backup energy source has been specified.

2.5 Exceptional Calculation Methods. Where no simulation program is available that adequately models a design, material, or device, the building official may approve an exceptional calculation method to demonstrate above-standard performance using this method.

Applications for approval of an exceptional method shall include documentation of the calculations performed and theoretical and/or empirical information supporting the accuracy of the method.

[Statutory Authority: RCW 19.27A.025, 19.27A.045. 10-03-115, 10-13-113 and 10-22-056, § 51-11-99902, filed 1/20/10, 6/21/10 and 10/28/10, effective 1/1/11. Statutory Authority: RCW 19.27A.022, 19.27A.025, 19.27A.-045, and chapters 19.27 and 34.05 RCW. 07-01-089, § 51-11-99902, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27A.020, 19.27A.045. 04-01-106, § 51-11-99902, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27A.025, 19.27A.045. 01-03-010, § 51-11-99902, filed 1/5/01, effective 7/1/01. Statutory Authority: RCW 19.27A.025. 93-21-052, § 51-11-99902, filed 10/18/93, effective 4/1/94.]

Reviser's note: Notice of Objection: The Joint Administrative Rules Review Committee (Committee) finds that, in adopting the 2009 proposed changes to the State Energy Code, Chapter 51-11 WAC, on November 20, 2009, the State Building Code Council (Council) failed to comply with all requirements of the law and failed to adequately respond to the Committee's request for additional economic impact and cost-benefit analyses prior to adoption.

On October 1, 2009, the Committee found that the Small Business Economic Impact Statement (SBEIS) for the proposed changes filed with the Code Reviser failed to comply with all requirements of law. The Committee requested that the Council conduct a cost-benefit analysis pursuant to RCW

34.05.328 and amend the SBEIS to provide additional economic impact information, including an estimate of the number of jobs that would be created or lost as a result of compliance with all the proposed rules, as required by RCW 19.85.040 (2)(d).

The Council provided the Committee with information and data on November 18, 2009. On December 2, 2009, the Committee found that the Council failed to adequately respond to the Committee's request for additional data. Specifically, the Committee found that the Council failed to amend the SBEIS to (a) estimate the number of jobs that would be created or lost as a result of compliance with the proposed changes; and (b) support the SBEIS with a detailed and rigorous costs analysis of the cumulative impact of all the changes. In addition, the Committee found that the Council failed to provide the Committee with a cost-benefit analysis of the proposed changes and pursuant to the requirements of RCW 34.05.328.

The Committee strongly supports a process that makes thoughtful and informed progress towards changes that result in improved energy efficiency in our buildings, wherever practicable. While the Council worked diligently, it is the opinion of the Committee that the Council did not fully develop and consider the economic impacts and costs versus benefits of these significant changes to our Energy Code. Furthermore, it is the opinion of the Committee that the Council and the Legislature need this information to fully evaluate the value, impacts, and consequences of the proposed codes, with due diligence to their respective fiduciary responsibilities, in order to create the best informed public policy.

As a result, the Committee recommends that the Governor suspend the adoption and implementation of the changes to the Energy Code, Chapter 51-11 WAC, adopted by the Council on November 20, 2009, until such time as a more adequate analysis has been completed and considered by the appropriate bodies.

For all of the above stated reasons, the Committee objects to the changes to the State Energy Code, Chapter 51-11 WAC, that were adopted by the Council on November 20, 2009, and hereby directs the Code Reviser, pursuant to RCW 34.05.640(4), to publish this Notice of Objection in the Washington State Register and along with any publication in the Washington Administrative Code of changes to Chapter 51-11 WAC that were adopted by the Council in 2009 and filed with the Code Reviser.

WAC 51-11-99903 Section 3—Calculation of the proposed and baseline building performance.

3.1 Building Performance Calculations. The simulation model for calculating the proposed and baseline building performance shall be developed in accordance with the requirements in Table 3.1.

For the baseline building and the proposed building, shading by permanent structures and terrain shall be taken into account for computing energy consumption whether or not these features are located on the building site. A permanent fixture is one that is likely to remain for the life of the proposed design.

3.1.1 Baseline HVAC System Type and Description. HVAC systems in the baseline building design shall be based on usage, number of floors, conditioned floor area, and heating source as specified in Table 3.1.1A and shall conform with the system descriptions in Table 3.1.1B. For systems 1, 2, 3, and 4, each thermal block shall be modeled with its own HVAC system. For systems 5, 6, 7, and 8, each floor shall be modeled with a separate HVAC system. Floors with identical thermal blocks can be grouped for modeling purposes.

EXCEPTIONS:

1. Use additional system type(s) for nonpredominant conditions (i.e., residential/nonresidential or heating source) if those conditions apply to more than 20,000 ft^2 of conditioned floor area.
2. If the baseline HVAC system type is 5, 6, 7, or 8, use separate single-zone systems conforming with the requirements of system 3 or system 4 (depending on building heating source) for any spaces that have occupancy or process loads or schedules that differ significantly from the rest of the building. Peak thermal loads that differ by 10 Btu/h·ft^2 or more from the average of other spaces served by the system or schedules that differ by more than 40 equivalent full-load hours per week from other spaces served by the system are considered to differ significantly. Examples where this exception may be applicable include, but are not limited to, computer server rooms, natatoriums, and continually occupied security areas.
3. If the baseline HVAC system type is 5, 6, 7, or 8, use separate single-zone systems conforming with the requirements of system 3 or system 4 (depending on building heat source) for any zones having special pressurization relationships, cross-contamination requirements, or code-required minimum circulation rates.
4. For laboratory spaces with a minimum of 5000 cfm of exhaust, use system type 5 or 7 that reduce the exhaust and makeup air volume to 50% of design values during unoccupied periods. For all-electric buildings, the heating shall be electric resistance.

3.1.1.1 Purchased Heat. For systems using purchased hot water or steam on-site boilers shall not be modeled in the baseline building design.

3.1.2 General Baseline HVAC System Requirements. HVAC systems in the baseline building design shall conform with the general provisions in this section.

3.1.2.1 Equipment Efficiencies. All HVAC equipment in the baseline building design shall be modeled at the minimum efficiency levels, both part load and full load, in accordance with Section 1411. Where efficiency ratings, such as EER and COP, include fan energy, the descriptor shall be broken down into its components so that supply fan energy can be modeled separately.

3.1.2.2 Equipment Capacities. The equipment capacities for the baseline building design shall be based on sizing runs for each orientation (per Table 3.1, No. 5a) and shall be oversized by 15% for cooling and 25% for heating, i.e., the ratio between the capacities used in the annual simulations and the capacities determined by the sizing runs shall be 1.15 for cooling and 1.25 for heating. Unmet load hours for the proposed design or baseline building designs shall not exceed 300 (of the 8760 hours simulated), and unmet load hours for the proposed design shall not exceed the number of unmet load hours for the baseline building design by more than 50. If unmet load hours in the proposed design exceed the unmet load hours in the baseline building by more than 50, simulated capacities in the baseline building shall be decreased incrementally and the building resimulated until the unmet load hours are within 50 of the unmet load hours of the proposed design. If unmet load hours for the proposed design or baseline building design exceed 300, simulated capacities shall be increased incrementally, and the building with unmet loads resimulated until unmet load hours are reduced to 300 or less. Alternatively, unmet load hours exceeding these limits may be accepted at the discretion of the building official provided that sufficient justification is given indicating that the accuracy of the simulation is not significantly compromised by these unmet loads.

3.1.2.2.1 Sizing Runs. Weather conditions used in sizing runs to determine baseline equipment capacities may be based either on hourly historical weather files containing typical peak conditions or on design days developed using 99.6% heating design temperatures and 1% dry-bulb and 1% wet-bulb cooling design temperatures.

3.1.2.3 Preheat Coils. If the HVAC system in the proposed design has a preheat coil and a preheat coil can be modeled in the baseline system, the baseline system shall be modeled with a preheat coil controlled in the same manner as the proposed design.

3.1.2.4 Fan System Operation. Supply and return fans shall operate continuously whenever spaces are occupied and shall be cycled to meet heating and cooling loads during unoccupied hours. If the supply fan is modeled as cycling and fan energy is included in the energy-efficiency rating of the equipment, fan energy shall not be modeled explicitly. Supply, return, and/or exhaust fans will remain on during occupied and unoccupied hours in spaces that have health and safety mandated minimum ventilation requirements during unoccupied hours.

3.1.2.5 Ventilation. Minimum outdoor air ventilation rates shall be the same for the proposed and baseline building designs.

EXCEPTION: When modeling demand-control ventilation in the proposed design when its use is not required by Section 1412.8.

3.1.2.6 Economizers. Outdoor air economizers shall not be included in baseline HVAC Systems 1 and 2 where not required by Section 1433. Outdoor air economizers shall be included in baseline HVAC Systems 3 through 8.

EXCEPTION: Economizers shall not be included for systems meeting one or more of the exceptions listed below.

1. Systems that include gas-phase air cleaning to meet the requirements of Section 6.1.2 in Standard 62.1. This exception shall be used only if the system in the proposed design does not match the building design.

2. Where the use of outdoor air for cooling will affect supermarket open refrigerated casework systems. This exception shall only be used if the system in the proposed design does not use an economizer. If the exception is used, an economizer shall not be included in the baseline building design.

3.1.2.7 Economizer High-Limit Shutoff. The high-limit shutoff shall be a dry-bulb switch with 75°F setpoint temperatures.

3.1.2.8 Design Airflow Rates. System design supply airflow rates for the baseline building design shall be based on a supply-air-to-room-air temperature difference of 20°F or the required ventilation air or makeup air, whichever is greater. If return or relief fans are specified in the proposed design, the baseline building design shall also be modeled with fans serving the same functions and sized for the baseline system supply fan air quantity less the minimum outdoor air, or 90% of the supply fan air quantity, whichever is larger.

3.1.2.9 System Fan Power. System fan electrical power for supply, return, exhaust, and relief (excluding power to fan-powered VAV boxes) shall be calculated using the following formulas:

For Systems 1 and 2,

$$P_{fan} = CFM_S \times 0.3.$$

For Systems 3 through 8,

$$P_{fan} = bhp \times 746/\text{Fan Motor Efficiency}.$$

Where:

P_{fan}	=	Electric power to fan motor (watts) and
bhp	=	Brake horsepower of baseline fan motor from Table 3.1.2.9.
Fan Motor Efficiency	=	The efficiency from Table 14-4 for the next motor size greater than the bhp using the enclosed motor at 1800 rpm.
CFM_S	=	The baseline system maximum design supply fan airflow rate in cfm.

3.1.2.10 Exhaust Air Energy Recovery. Systems shall conform with the provisions of Chapter 14.

3.1.3 System-Specific Baseline HVAC System Requirements. Baseline HVAC systems shall conform with provisions in this section, where applicable, to the specified baseline system types as indicated in section headings.

3.1.3.1 Heat Pumps (Systems 2 and 4). Electric air-source heat pumps shall be modeled with electric auxiliary heat. The systems shall be controlled with multistage space thermostats and an outdoor air thermostat wired to energize auxiliary heat only on the last thermostat stage and when outdoor air temperature is less than 40°F.

3.1.3.2 Type and Number of Boilers (Systems 1, 5, and 7). The boiler plant shall use the same fuel as the proposed design and shall be natural draft, except as noted in Section 3.1.1.1. The baseline building design boiler plant shall be modeled as having a single boiler if the baseline building design plant serves a conditioned floor area of 15,000 ft^2 or less and as having two equally sized boilers for plants serving more than 15,000 ft^2. Boilers shall be staged as required by the load.

3.1.3.3 Hot-Water Supply Temperature (Systems 1, 5, and 7). Hot-water design supply temperature shall be modeled as 180°F and design return temperature as 130°F.

3.1.3.4 Hot-Water Supply Temperature Reset (Systems 1, 5, and 7). Hot-water supply temperature shall be reset based on outdoor dry-bulb temperature using the following schedule: 180°F at 20°F and below, 150°F at 50°F and above, and ramped linearly between 180°F and 150°F at temperatures between 20°F and 50°F.

3.1.3.5 Hot-Water Pumps (Systems 1, 5, and 7). The baseline building design hot-water pump power shall be 19 W/gpm. The pumping system shall be modeled as primary-only with continuous variable flow. Hot-water systems serving 120,000 ft^2 or more shall be modeled with variable-speed drives, and systems serving less than 120,000 ft^2 shall be modeled as riding the pump curve.

3.1.3.6 Piping Losses (Systems 1, 5, 7, and 8). Piping losses shall not be modeled in either the proposed or baseline building designs for hot water, chilled water, or steam piping.

3.1.3.7 Type and Number of Chillers (Systems 7 and 8). Electric chillers shall be used in the baseline building design regardless of the cooling energy source, e.g., direct-fired absorption, absorption from purchased steam, or purchased chilled water. The baseline building design's chiller plant shall be modeled with chillers having the number and type as

indicated in Table 3.1.3.7 as a function of building peak cooling load.

3.1.3.8 Chilled-Water Design Supply Temperature (Systems 7 and 8). Chilled-water design supply temperature shall be modeled at 44°F and return water temperature at 56°F.

3.1.3.9 Chilled-Water Supply Temperature Reset (Systems 7 and 8). Chilled-water supply temperature shall be reset based on outdoor dry-bulb temperature using the following schedule: 44°F at 80°F and above, 54°F at 60°F and below, and ramped linearly between 44°F and 54°F at temperatures between 80°F and 60°F.

3.1.3.10 Chilled-Water Pumps (Systems 7 and 8). The baseline building design pump power shall be 22 W/gpm. Chilled-water systems with a cooling capacity of 300 tons or more shall be modeled as primary/secondary systems with variable-speed drives on the secondary pumping loop. Chilled-water pumps in systems serving less than 300 tons cooling capacity shall be modeled as primary/secondary systems with secondary pump riding the pump curve.

3.1.3.11 Heat Rejection (Systems 7 and 8). The heat rejection device shall be an axial fan cooling tower with two-speed fans. Condenser water design supply temperature shall be 85°F or 10°F approaching design wet-bulb temperature, whichever is lower, with a design temperature rise of 10°F. The tower shall be controlled to maintain a 70°F leaving water temperature where weather permits, floating up to leaving water temperature at design conditions. The baseline building design condenser-water pump power shall be 19 W/gpm. Each chiller shall be modeled with separate condenser water and chilled-water pumps interlocked to operate with the associated chiller.

3.1.3.12 Supply Air Temperature Reset (Systems 5 through 8). The air temperature for cooling shall be reset higher by 5°F under the minimum cooling load conditions.

3.1.3.13 VAV Minimum Flow Setpoints (Systems 5 and 7). Minimum volume setpoints for VAV reheat boxes shall be 0.4 cfm/ft² of floor area served or the minimum ventilation rate, whichever is larger.

3.1.3.14 Fan Power (Systems 6 and 8). Fans in parallel VAV fan-powered boxes shall be sized for 50% of the peak design flow rate and shall be modeled with 0.35 W/cfm fan power. Minimum volume setpoints for fan-powered boxes shall be equal to 30% of peak design flow rate or the rate required to meet the minimum outdoor air ventilation requirement, whichever is larger. The supply air temperature setpoint shall be constant at the design condition.

3.1.3.15 VAV Fan Part-Load Performance (Systems 5 through 8). VAV system supply fans shall have variable-speed drives, and their part-load performance characteristics shall be modeled using either Method 1 or Method 2 specified in Table 3.1.3.15.

TABLE 3.1
Modeling Requirements for Calculating Proposed and Baseline Building Performance

No.	Proposed Building Performance	Baseline Building Performance
1. Design Model	a. The simulation model of the proposed design shall be consistent with the design documents, including proper accounting of fenestration and opaque envelope types and areas; interior lighting power and controls; HVAC system types, sizes, and controls; and service water heating systems and controls. All end-use load components within and associated with the building shall be modeled, including, but not limited to, exhaust fans, parking garage ventilation fans, snow-melt and freeze-protection equipment, facade lighting, swimming pool heaters and pumps, elevators and escalators, refrigeration, and cooking. Where the simulation program does not specifically model the functionality of the installed system, spreadsheets or other documentation of the assumptions shall be used to generate the power demand and operating schedule of the systems. b. All conditioned spaces in the proposed design shall be simulated as being both heated and cooled even if no heating or cooling system is to be installed, and temperature and humidity control setpoints and schedules shall be the same for proposed and baseline building designs. c. When the performance rating method is applied to buildings in which energy-related features have not yet been designed (e.g., a lighting system), those yet-to-be-designed features shall be described in the proposed design exactly as they are defined in the baseline building design. Where the space classification for a space is not known, the space shall be categorized as an office space.	The baseline building design shall be modeled with the same number of floors and identical conditioned floor area as the proposed design.
2. Additions and Alterations	It is acceptable to predict performance using building models that exclude parts of the existing building provided that all of the following conditions are met: a. Work to be performed in excluded parts of the building shall meet the requirements of Chapters 11 through 15. b. Excluded parts of the building are served by HVAC systems that are entirely separate from those serving parts of the building that are included in the building model. c. Design space temperature and HVAC system operating setpoints and schedules on either side of the boundary between included and excluded parts of the building are essentially the same.	Same as Proposed Design

No.	Proposed Building Performance	Baseline Building Performance
	d. If a declining block or similar utility rate is being used in the analysis and the excluded and included parts of the building are on the same utility meter, the rate shall reflect the utility block or rate for the building plus the addition.	
	3. Space Use Classification Usage shall be specified using the building type or space type lighting classifications in accordance with Sections 1530 through 1531. The user shall specify the space use classifications using either the building type or space type categories but shall not combine the two types of categories. More than one building type category may be used in a building if it is a mixed-use facility. If space type categories are used, the user may simplify the placement of the various space types within the building model, provided that building-total areas for each space type are accurate.	Same as Proposed Design
	4. Schedules Schedules capable of modeling hourly variations in occupancy, lighting power, miscellaneous equipment power, thermostat setpoints, and HVAC system operation shall be used. The schedules shall be typical of the proposed building type as determined by the designer and approved by the building official. Default schedules are included in Tables 3.3A through 3.3J. HVAC Fan Schedules. Schedules for HVAC fans that provide outdoor air for ventilation shall run continuously whenever spaces are occupied and shall be cycled on and off to meet heating and cooling loads during unoccupied hours. Exceptions: a. Where no heating and/or cooling system is to be installed and a heating or cooling system is being simulated only to meet the requirements described in this table, heating and/or cooling system fans shall not be simulated as running continuously during occupied hours but shall be cycled on and off to meet heating and cooling loads during all hours. b. HVAC fans shall remain on during occupied and unoccupied hours in spaces that have health and safety mandated minimum ventilation requirements during unoccupied hours.	Same as Proposed Design Exception: Schedules may be allowed to differ between proposed design and baseline building design when necessary to model nonstandard efficiency measures, provided that the revised schedules have the approval of the building official. Measures that may warrant use of different schedules include, but are not limited to, lighting controls, natural ventilation, demand control ventilation, and measures that reduce service water heating loads.
	5. Building Envelope All components of the building envelope in the proposed design shall be modeled as shown on architectural drawings or as built for existing building envelopes. Exceptions: The following building elements are permitted to differ from architectural drawings. a. All uninsulated assemblies (e.g., projecting balconies, perimeter edges of intermediate floor slabs, concrete floor beams over parking garages, roof parapet) shall be separately modeled using either of the following techniques: 1. Separate model of each of these assemblies within the energy simulation model. 2. Separate calculation of the U-factor for each of these assemblies. The U-factors of these assemblies are then averaged with larger adjacent surfaces using an area-weighted average method. This average U-factor is modeled within the energy simulation model. Any other envelope assembly that covers less than 5% of the total area of that assembly type (e.g., exterior walls) need not be separately described provided that it is similar to an assembly being modeled. If not separately described, the area of an envelope assembly shall be added to the area of an assembly of that same type with the same orientation and thermal properties.	Equivalent dimensions shall be assumed for each exterior envelope component type as in the proposed design; i.e., the total gross area of exterior walls shall be the same in the proposed and baseline building designs. The same shall be true for the areas of roofs, floors, and doors, and the exposed perimeters of concrete slabs on grade shall also be the same in the proposed and baseline building designs. The following additional requirements shall apply to the modeling of the baseline building design: a. **Orientation.** The baseline building performance shall be generated by simulating the building with its actual orientation and again after rotating the entire building 90, 180, and 270 degrees, then averaging the results. The building shall be modeled so that it does not shade itself.
		b. **Opaque Assemblies.** Opaque assemblies used for new buildings or additions shall conform with the following common, lightweight assembly types and shall match the appropriate assembly maximum U-factors in Tables 13-1 and 13-2: • Roofs—Insulation entirely above deck • Above-grade walls—Steel-framed • Floors—Steel-joist • Opaque door types shall match the proposed design and conform to the U-factor requirements from the same tables. • Slab-on-grade floors shall match the F-factor for unheated slabs from the same tables. Opaque assemblies used for alterations shall conform with Section 1132.1.
	b. Exterior surfaces whose azimuth orientation and tilt differ by less than 45 degrees and are otherwise the same may be described as either a single surface or by using multipliers. c. For exterior roofs, the roof surface may be modeled with a reflectance of 0.45 if the reflectance of the proposed design roof is greater than 0.70 and its emittance is greater than 0.75 or has a minimum SRI of 82. Reflectance values shall be based on testing in accordance with ASTM C1549, ASTM E903, or ASTM E1918, and emittance values shall be based on testing in accordance with ASTM C1371 or ASTM E408, and SRI shall be based on ASTM E1980 calculated at medium wind speed. All other roof surfaces shall be modeled with a reflectance of 0.30. d. Manual fenestration shading devices such as blinds or shades shall not be modeled. Automatically controlled fenestration shades or blinds may be modeled. Permanent shading devices such as fins, overhangs, and light shelves may be modeled.	c. **Vertical Fenestration.** Vertical fenestration areas for new buildings and additions shall equal that in the proposed design or 40% of gross above-grade wall area, whichever is smaller, and shall be distributed on each face of the building in the same proportions in the proposed design. Fenestration U-factors and SHGC shall match the appropriate requirements in Tables 13-1 and 13-2. All vertical glazing shall be assumed to be flush with the exterior wall, and no shading projections shall be modeled. Manual window shading devices such as blinds or shades shall not be modeled. The fenestration areas for envelope alterations shall reflect the limitations on area, U-factor, and SHGC as described in Section 1132.1.

No.	Proposed Building Performance	Baseline Building Performance
		d. **Skylights and Glazed Smoke Vents.** Skylight area shall be equal to that in the proposed building design or 5% of the gross roof area that is part of the building envelope, whichever is smaller. If the skylight area of the proposed building design is greater than 5% of the gross roof area, baseline skylight area shall be decreased by an identical percentage in all roof components in which skylights are located to reach the 5% skylight-to-roof ratio. Skylight orientation and tilt shall be the same as in the proposed building design. Skylight U-factor and SHGC properties shall match the appropriate requirements in Tables 13-1 and 13-2. e. **Roof albedo.** All roof surfaces shall be modeled with a reflectivity of 0.30. f. **Existing Buildings.** For existing building envelopes, the baseline building design shall reflect existing conditions prior to any revisions that are part of the scope of work being evaluated.
	6. Lighting Lighting power in the proposed design shall be determined as follows: a. Where a complete lighting system exists, the actual lighting power for each thermal block shall be used in the model. b. Where a lighting system has been designed, lighting power shall be determined in accordance with Chapter 15. c. Where lighting neither exists nor is specified, lighting power shall be determined in accordance with the building area method for the appropriate building type. d. Lighting system power shall include all lighting system components shown or provided for on the plans (including lamps and ballasts and task and furniture-mounted fixtures). Exception: For multifamily dwelling units, hotel/motel guest rooms, and other spaces in which lighting systems are connected via receptacles and are not shown or provided for on building plans, assume identical lighting power for the proposed and baseline building designs in the simulations. e. Lighting power for parking garages and building facades shall be modeled. f. Credit may be taken for the use of automatic controls for daylight utilization not otherwise required by Section 1513 but only if their operation is either modeled directly in the building simulation or modeled in the building simulation through schedule adjustments determined by a separate daylighting analysis approved by the building official. g. For automatic lighting controls in addition to those required for minimum code compliance under Section 1513, credit may be taken for automatically controlled systems by reducing the connected lighting power by the applicable percentages listed in Table 3.2. Alternatively, credit may be taken for these devices by modifying the lighting schedules used for the proposed design, provided that credible technical documentation for the modifications are provided to the building official.	Lighting power in the baseline building design shall be determined using the same categorization procedure and categories as the proposed design with lighting power set equal to the maximum allowed for the corresponding method and category in Chapter 15. Automatic lighting controls (e.g., programmable controls or automatic controls for daylight utilization) shall be modeled in the baseline building design as required by Section 1513.
	7. Thermal Blocks—HVAC Zones Designed Where HVAC zones are defined on HVAC design drawings, each HVAC zone shall be modeled as a separate thermal block. Exception: Different HVAC zones may be combined to create a single thermal block or identical thermal blocks to which multipliers are applied, provided that all of the following conditions are met: a. The space use classification is the same throughout the thermal block. b. All HVAC zones in the thermal block that are adjacent to glazed exterior walls face the same orientation or their orientations vary by less than 45 degrees. c. All of the zones are served by the same HVAC system or by the same kind of HVAC system.	Same as Proposed Design
	8. Thermal Blocks—HVAC Zones Not Designed Where the HVAC zones and systems have not yet been designed, thermal blocks shall be defined based on similar internal load densities, occupancy, lighting, thermal and space temperature schedules, and in combination with the following guidelines: a. Separate thermal blocks shall be assumed for interior and perimeter spaces. Interior spaces shall be those located greater than 15 ft from an exterior wall. Perimeter spaces shall be those located within 15 ft of an exterior wall. b. Separate thermal blocks shall be assumed for spaces adjacent to glazed exterior walls; a separate zone shall be provided for each orientation, except that orientations that differ by less than 45 degrees may be considered to be the same orientation. Each zone shall include all floor area that is 15 ft or less from a glazed perimeter wall, except that floor area within 15 ft of glazed perimeter walls having more than one orientation shall be divided proportionately between zones. c. Separate thermal blocks shall be assumed for spaces having floors that are in contact with the ground or exposed to ambient conditions from zones that do not share these features. d. Separate thermal blocks shall be assumed for spaces having exterior ceiling or roof assemblies from zones that do not share these features.	Same as Proposed Design.

No.	Proposed Building Performance	Baseline Building Performance
9. Thermal Blocks—Multifamily Residential Buildings	Residential spaces shall be modeled using at least one thermal block per dwelling unit, except that those units facing the same orientations may be combined into one thermal block. Corner units and units with roof or floor loads shall only be combined with units sharing these features.	Same as Proposed Design.
10. HVAC Systems	The HVAC system type and all related performance parameters in the proposed design, such as equipment capacities and efficiencies, shall be determined as follows: a. Where a complete HVAC system exists, the model shall reflect the actual system type using actual component capacities and efficiencies. b. Where an HVAC system has been designed, the HVAC model shall be consistent with design documents. Mechanical equipment efficiencies shall be adjusted from actual design conditions to the standard rating conditions specified in Section 1411 if required by the simulation model. c. Where no heating system exists or no heating system has been specified, the heating system classification shall be assumed to be electric, and the system characteristics shall be identical to the system modeled in the baseline building design. d. Where no cooling system exists or no cooling system has been specified, the cooling system shall be identical to the system modeled in the baseline building design.	The HVAC system(s) in the baseline building design shall be of the type and description specified in Section 3.1.1, shall meet the general HVAC system requirements specified in Section 3.1.2, and shall meet any system-specific requirements in Section 3.1.3 that are applicable to the baseline HVAC system type(s).
11. Service Hot-Water Systems	The service hot-water system type and all related performance parameters, such as equipment capacities and efficiencies, in the proposed design shall be determined as follows: a. Where a complete service hot-water system exists, the proposed design shall reflect the actual system type using actual component capacities and efficiencies. b. Where a service hot-water system has been specified, the service hot-water model shall be consistent with design documents. c. Where no service hot-water system exists or has been specified but the building will have service hot-water loads, a service hot-water system shall be modeled that matches the system in the baseline building design and serves the same hot-water loads. d. For buildings that will have no service hot-water loads, no service hot-water system shall be modeled.	The service hot-water system in the baseline building design shall use the same energy source as the corresponding system in the proposed design and shall conform with the following conditions: a. Where the complete service hot-water system exists, the baseline building design shall reflect the actual system type using the actual component capacities and efficiencies. b. Where a new service hot-water system has been specified, the system shall be sized using the same methods and values as the proposed design and the equipment shall match the minimum efficiency requirements in Chapter 14. Where the energy source is electricity, the heating method shall be electrical resistance. c. Where no service hot-water system exists or has been specified but the building will have service hot-water loads, a service water system(s) using electrical-resistance heat and matching minimum efficiency requirements of Chapter 14 shall be assumed and modeled identically in the proposed and baseline building designs. d. For buildings that will have no service hot-water loads, no service hot-water heating shall be modeled. e. Where a combined system has been specified to meet both space heating and service water heating loads, the baseline building system shall use separate systems meeting the minimum efficiency requirements applicable to each system individually. f. For large, 24-hour-per-day facilities that meet the prescriptive criteria for use of condenser heat recovery systems described in Section 1436.3, a system meeting the requirements of that section shall be included in the baseline building design regardless of the exceptions to Section 1436.3. Exception: If a condenser heat recovery system meeting the requirements described in Section 1436.3 cannot be modeled, the requirement for including such a system in the actual building shall be met as a prescriptive requirement in accordance with Section 1436.3, and no heat-recovery system shall be included in the proposed or baseline building designs. g. Service hot-water energy consumption shall be calculated explicitly based upon the volume of service hot water required and the entering makeup water and the leaving service hot-water temperatures. Entering water temperatures shall be estimated based upon the location. Leaving temperatures shall be based upon the end-use requirements. h. Where recirculation pumps are used to ensure prompt availability of service hot water at the end use, the energy consumption of such pumps shall be calculated explicitly. i. Service water loads and usage shall be the same for both the baseline building design and the proposed design and shall be documented by the calculation procedures recommended by the manufacturer's specifications or generally accepted engineering methods. Exceptions: 1. Appliances that are not built-in (e.g., washing machines) and plumbing fixtures (e.g., faucets and low-flow showerheads) shall be modeled the same for both the baseline building design and the proposed design. Other service hot-water usage can be demonstrated to be reduced by documented water conservation measures that reduce the physical volume of service water required. Such reduction shall be demonstrated by calculations.

No.	Proposed Building Performance	Baseline Building Performance
		2. Service hot-water energy consumption can be demonstrated to be reduced by reducing the required temperature of service mixed water, by increasing the temperature, or by increasing the temperature of the entering makeup water. Examples include alternative sanitizing technologies for dishwashing and heat recovery to entering makeup water. Such reduction shall be demonstrated by calculations. 3. Service hot-water usage can be demonstrated to be reduced by reducing the hot fraction of mixed water to achieve required operational temperature. Examples include shower or laundry heat recovery to incoming cold-water supply, reducing the hot-water fraction required to meet required mixed-water temperature. Such reduction shall be demonstrated by calculations.
12. Receptacle and Other Loads	Receptacle and process loads where not otherwise covered by this code, such as those for office and other equipment, shall be estimated based on the building type or space type category and shall be assumed to be identical in the proposed and baseline building designs. These loads shall be included in simulations of the building and shall be included when calculating the baseline building performance and proposed building performance. Default process loads are included in Table 4.	Other systems, such as motors covered by Sections 1437, 1438 and 1511, and miscellaneous loads shall be modeled as identical to those in the proposed design including schedules of operation and control of the equipment. Where there are specific efficiency requirements in Sections 1437, 1438 and 1511, these systems or components shall be modeled as having the lowest efficiency allowed by those requirements. Where no efficiency requirements exist, power and energy rating or capacity of the equipment shall be identical between the baseline building and the proposed design with the following exception: Variations of the power requirements, schedules, or control sequences of the equipment modeled in the baseline building from those in the proposed design may be allowed by the building official based upon documentation that the equipment installed in the proposed design represents a significant verifiable departure from documented conventional practice. The burden of this documentation is to demonstrate that accepted conventional practice would result in baseline building equipment different from that installed in the proposed design. Occupancy and occupancy schedules may not be changed. Process loads must represent a minimum of 25% of the total baseline building energy consumption. For buildings where the process energy is less than 25% of the baseline building energy usage, the permit submittal must include supporting documentation substantiating that process energy inputs are appropriate.
13. Modeling Limitations to the Simulation Program	If the simulation program cannot model a component or system included in the proposed design explicitly, substitute a thermodynamically similar component model that can approximate the expected performance of the component that cannot be modeled explicitly.	Same as Proposed Design.

TABLE 3.1.1A
Baseline HVAC System Types

Building Type	Fossil Fuel, Fossil/Electric Hybrid, and Purchased Heat	Electric and Other
Residential	System 1—PTAC	System 2—PTHP
Nonresidential and 3 Floors or Less and <25,000 ft^2	System 3—PSZ-AC	System 4—PSZ-HP
Nonresidential and 4 or 5 Floors and <25,000 ft^2 or	System 5—Packaged	System 6—Packaged VAV
5 Floors or Less and 25,000 ft^2 to 150,000 ft^2	VAV with Reheat	with PFP Boxes
Nonresidential and More than 5 Floors or >150,000 ft^2	System 7—VAV with Reheat	System 8—VAV with PFP Boxes

Notes: Residential building types include dormitory, hotel, motel, and multifamily. Residential space types include guest rooms, living quarters, private living space, and sleeping quarters. Other building and space types are considered nonresidential.
Where no heating system is to be provided or no heating energy source is specified, use the "Electric and Other" heating source classification.
Where attributes make a building eligible for more than one baseline system type, use the predominant condition to determine the system type for the entire building.
For laboratory spaces with a minimum of 5000 cfm of exhaust, use system type 5 or 7 and reduce the exhaust and makeup air volume to 50% of design values during unoccupied periods. For all-electric buildings, the heating shall be electric resistance.

TABLE 3.1.1B
Baseline System Descriptions

System No.	System Type	Fan Control	Cooling Type	Heating Type[1]
1. PTAC	Packaged terminal air conditioner	Constant volume	Direct expansion	Hot-water fossil fuel boiler
2. PTHP	Packaged terminal heat pump	Constant volume	Direct expansion	Electric heat pump
3. PSZ-AC	Packaged rooftop air conditioner	Constant volume	Direct expansion	Fossil fuel furnace
4. PSZ-HP	Packaged rooftop heat pump	Constant volume	Direct expansion	Electric heat pump
5. Packaged VAV with Reheat	Packaged rooftop VAV with reheat	VAV	Direct expansion	Hot-water fossil fuel boiler

System No.	System Type	Fan Control	Cooling Type	Heating Type[1]
6. Packaged VAV with PFP Boxes	Packaged rooftop VAV with reheat	VAV	Direct expansion	Electric resistance
7. VAV with Reheat	Packaged rooftop VAV with reheat	VAV	Chilled water	Hot-water fossil fuel boiler
8. VAV with PFP Boxes	VAV with reheat	VAV	Chilled water	Electric resistance

TABLE 3.1.2.9
Baseline Fan Brake Horsepower

Baseline Fan Motor Brake Horsepower	
Constant Volume Systems 3-4	**Variable Volume Systems 5-8**
CFM_s x 0.00094 + A	CFM_s x 0.0013 + A

Where A is calculated as follows using the pressure drop adjustment from the proposed building design and the design flow rate of the baseline building system.

A	=	Sum of [PD x CFM_D/4131] where:
PD	=	Each applicable pressure drop adjustment from the table below in in. w.c.
CFM_D	=	The design air flow through each applicable device from the table below in cubic feet per minute.

Do not include pressure drop adjustments for evaporative coolers or heat recovery devices that are not required in the baseline building system by Section 3.1.2.10.

TABLE 3.1.2.9B
Fan Power Limitation Pressure Drop Adjustment

Device	Adjustment
Credits	
Fully ducted return and/or exhaust air systems	0.5 in. w.c.
Return and/or exhaust airflow control devices	0.5 in. w.c.
Exhaust filters, scrubbers, or other exhaust treatment	The pressure drop of device calculated at fan system design condition
Particulate Filtration Credit: MERV 9 through 12	0.5 in. w.c.
Particulate Filtration Credit: MERV 13 through 15	0.9 in. w.c.
Particulate Filtration Credit: MERV 16 and greater and electronically enhanced filters	Pressure drop calculated at 2× clean filter pressure drop at fan system design condition
Carbon and other gas-phase air cleaners	Clean filter pressure drop at fan system design condition
Heat recovery device	Pressure drop of device at fan system design condition
Evaporative humidifier/cooler in series with another cooling coil	Pressure drop of device at fan system design condition
Sound Attenuation Section	0.15 in. w.c.
Deductions	
Fume Hood Exhaust Exception (required if 6.5.3.1.1 Exception [c] is taken)	-1.0 in. w.c.

[1]Heating fuel source for the baseline system shall match the proposed system in all cases for both primary and supplemental heat.

TABLE 3.1.3.7
Type and Number of Chillers

Building Peak Cooling Load	Number and Type of Chiller(s)
<300 tons	1 water-cooled screw chiller
>300 tons, <600 tons	2 water-cooled screw chillers sized equally
>600 tons	2 water-cooled centrifugal chillers minimum with chillers added so that no chiller is larger than 800 tons, all sized equally

TABLE 3.1.3.15
Part-Load Performance for VAV Fan Systems

Method 1—Part-Load Fan Power Data

Fan Part-Load Ratio	Fraction of Full-Load Power
0.00	0.00
0.10	0.03
0.20	0.07
0.30	0.13
0.40	0.21
0.50	0.30
0.60	0.41
0.70	0.54
0.80	0.68
0.90	0.83
1.00	1.00

Method 2—Part-Load Fan Power Equation

P_{fan} = $0.0013 + 0.1470 \times PLR_{fan} + 0.9506 \times (PLR_{fan})^2 - 0.0998 \times (PLR_{fan})^3$

where:

P_{fan} = Fraction of full-load fan power and

PLR_{fan} = Fan part-load ratio (current cfm/design cfm).

TABLE 3.2
Power Adjustment Percentages for Automatic Lighting Controls

Automatic Control Device(s)	Exterior Lighting
1. Programmable timing control	0%
2. Occupancy sensor	10%
3. Occupancy sensor and programmable timing control	10%

TABLE 3.3A
Assembly Occupancy[1]

Hour of Day (time)	Schedule for Occupancy Percent of Maximum Load			Schedule for Lighting Receptacle Percent of Maximum Load			Schedule for HVAC System			Schedule for Service Hot Water Percent of Maximum Load			Schedule for Elevator Percent of Maximum Load		
	Wk	Sat	Sun	Wk	Sat	Sun	Wk	Sat	Sun	Wk	Sat	Sun	Wk	Sat	Sun
1 (12-1am)	0	0	0	5	5	5	off	off	off	0	0	0	0	0	0
2 (1-2am)	0	0	0	5	5	5	off	off	off	0	0	0	0	0	0
3 (2-3am)	0	0	0	5	5	5	off	off	off	0	0	0	0	0	0
4 (3-4am)	0	0	0	5	5	5	off	off	off	0	0	0	0	0	0
5 (4-5am)	0	0	0	5	5	5	off	off	off	0	0	0	0	0	0
6 (5-6am)	0	0	0	5	5	5	on	off	off	0	0	0	0	0	0
7 (6-7am)	0	0	0	40	5	5	on	on	on	0	0	0	0	0	0
8 (7-8am)	0	0	0	40	30	30	on	on	on	0	0	0	0	0	0
9 (8-9am)	20	20	10	40	30	30	on	on	on	0	0	0	0	0	0
10 (9-10am)	20	20	10	75	50	30	on	on	on	5	5	5	0	0	0
11 (10-11am)	20	20	10	75	50	30	on	on	on	5	5	5	0	0	0
12 (11-12pm)	80	60	10	75	50	30	on	on	on	35	20	10	0	0	0
13 (12-1pm)	80	60	10	75	50	65	on	on	on	5	0	0	0	0	0
14 (1-2pm)	80	60	70	75	50	65	on	on	on	5	0	0	0	0	0
15 (2-3pm)	80	60	70	75	50	65	on	on	on	5	0	0	0	0	0
16 (3-4pm)	80	60	70	75	50	65	on	on	on	5	0	0	0	0	0
17 (4-5pm)	80	60	70	75	50	65	on	on	on	5	0	0	0	0	0
18 (5-6pm)	80	60	70	75	50	65	on	on	on	0	0	0	0	0	0
19 (6-7pm)	20	60	70	75	50	65	on	on	on	0	0	0	0	0	0
20 (7-8pm)	20	60	70	75	50	65	on	on	on	0	65	65	0	0	0
21 (8-9pm)	20	60	70	75	50	65	on	on	on	0	30	30	0	0	0
22 (9-10pm)	20	80	70	75	50	65	on	on	on	0	0	0	0	0	0
23 (10-11pm)	10	10	20	25	50	5	on	on	on	0	0	0	0	0	0
24 (11-12am)	0	0	0	5	5	5	off	off	off	0	0	0	0	0	0
Total/Day	710	750	700	1155	800	845	1800	1700	1700	70	125	115	0	0	0
Total/Week		50.50	hours		74.20	hours		124	hours		5.9	hours		0	hours
Total/Year		2633	hours		3869	hours		6465	hours		308	hours		0	hours

Wk = Weekday

1. Schedules for occupancy, lighting, receptacle, HVAC system and service hot water are from ASHRAE Standard 90.1-1989 and addendums, except that 5% emergency lighting has been added for all off hours. Elevator schedules, except for restaurants, are from the U.S. Department of Energy Standard Evaluation Techniques except changed to 0% when occupancy is 0%. THESE VALUES MAY BE USED ONLY IF ACTUAL SCHEDULES ARE NOT KNOWN.

TABLE 3.3B
Health Occupancy[1]

Hour of Day (time)	Schedule for Occupancy Percent of Maximum Load			Schedule for Lighting Receptacle Percent of Maximum Load			Schedule for HVAC System			Schedule for Service Hot Water Percent of Maximum Load			Schedule for Elevator Percent of Maximum Load		
	Wk	Sat	Sun	Wk	Sat	Sun	Wk	Sat	Sun	Wk	Sat	Sun	Wk	Sat	Sun
1 (12-1am)	0	0	0	10	10	5	on	on	on	1	1	1	0	0	0
2 (1-2am)	0	0	0	10	10	5	on	on	on	1	1	1	0	0	0
3 (2-3am)	0	0	0	10	10	5	on	on	on	1	1	1	0	0	0
4 (3-4am)	0	0	0	10	10	5	on	on	on	1	1	1	0	0	0
5 (4-5am)	0	0	0	10	10	5	on	on	on	1	1	1	0	0	0
6 (5-6am)	0	0	0	10	10	5	on	on	on	1	1	1	0	0	0
7 (6-7am)	0	0	0	10	10	5	on	on	on	1	1	1	0	0	0
8 (7-8am)	10	10	0	50	20	5	on	on	on	17	1	1	2	2	0
9 (8-9am)	50	30	5	90	40	10	on	on	on	58	20	1	75	46	2
10 (9-10am)	80	40	5	90	40	10	on	on	on	66	28	1	100	70	2
11 (10-11am)	80	40	5	90	40	10	on	on	on	78	30	1	100	70	2
12 (11-12pm)	80	40	5	90	40	10	on	on	on	82	30	1	100	70	2
13 (12-1pm)	80	40	5	90	40	10	on	on	on	71	24	1	75	51	2
14 (1-2pm)	80	40	5	90	40	10	on	on	on	82	24	1	100	51	2
15 (2-3pm)	80	40	5	90	40	10	on	on	on	78	23	1	100	51	2
16 (3-4pm)	80	40	5	90	40	10	on	on	on	74	23	1	100	51	2
17 (4-5pm)	80	40	0	30	40	5	on	on	on	63	23	1	100	51	0
18 (5-6pm)	50	10	0	30	40	5	on	on	on	41	10	1	100	25	0
19 (6-7pm)	30	10	0	30	10	5	on	on	on	18	1	1	52	2	0
20 (7-8pm)	30	0	0	30	10	5	on	on	on	18	1	1	52	0	0
21 (8-9pm)	20	0	0	30	10	5	on	on	on	18	1	1	52	0	0
22 (9-10pm)	20	0	0	30	10	5	on	on	on	10	1	1	28	0	0

Hour of Day (time)		Schedule for Occupancy Percent of Maximum Load			Schedule for Lighting Receptacle Percent of Maximum Load			Schedule for HVAC System			Schedule for Service Hot Water Percent of Maximum Load			Schedule for Elevator Percent of Maximum Load		
		Wk	Sat	Sun	Wk	Sat	Sun	Wk	Sat	Sun	Wk	Sat	Sun	Wk	Sat	Sun
23	(10-11pm)	0	0	0	30	10	5	on	on	on	1	1	1	0	0	0
24	(11-12am)	0	0	0	10	10	5	on	on	on	1	1	1	0	0	0
Total/Day		850	380	40	1060	550	160	2400	2400	2400	783	249	24	1136	540	16
Total/Week			46.70	hours		60.10	hours		168	hours		41.88	hours		62.36	hours
Total/Year			2435	hours		3134	hours		8760	hours		2148	hours		3251	hours

Wk = Weekday

1. Schedules for occupancy, lighting, receptacle, HVAC system and service hot water are from ASHRAE Standard 90.1-1989 and addendums, except that 5% emergency lighting has been added for all off hours. Elevator schedules, except for restaurants, are from the U.S. Department of Energy Standard Evaluation Techniques except changed to 0% when occupancy is 0%. THESE VALUES MAY BE USED ONLY IF ACTUAL SCHEDULES ARE NOT KNOWN.

TABLE 3.3C

Hotel/Motel Occupancy[1]

Hour of Day (time)		Schedule for Occupancy Percent of Maximum Load			Schedule for Lighting Receptacle Percent of Maximum Load			Schedule for HVAC System			Schedule for Service Hot Water Percent of Maximum Load			Schedule for Elevator Percent of Maximum Load		
		Wk	Sat	Sun	Wk	Sat	Sun	Wk	Sat	Sun	Wk	Sat	Sun	Wk	Sat	Sun
1	(12-1am)	90	90	70	20	20	30	on	on	on	20	20	25	40	44	55
2	(1-2am)	90	90	70	15	20	30	on	on	on	15	15	20	33	35	55
3	(2-3am)	90	90	70	10	10	20	on	on	on	15	15	20	33	35	43
4	(3-4am)	90	90	70	10	10	20	on	on	on	15	15	20	33	35	43
5	(4-5am)	90	90	70	10	10	20	on	on	on	20	20	20	33	35	43
6	(5-6am)	90	90	70	20	10	20	on	on	on	25	25	30	33	35	43
7	(6-7am)	70	70	70	40	30	30	on	on	on	50	40	50	42	40	52
8	(7-8am)	40	50	70	50	30	40	on	on	on	60	50	50	42	32	52
9	(8-9am)	40	50	50	40	40	40	on	on	on	55	50	50	52	45	65
10	(9-10am)	20	30	50	40	40	30	on	on	on	45	50	55	52	45	65
11	(10-11am)	20	30	50	25	30	30	on	on	on	40	45	50	40	42	53
12	(11-12pm)	20	30	30	25	25	30	on	on	on	45	50	50	51	60	60
13	(12-1pm)	20	30	30	25	25	30	on	on	on	40	50	40	51	65	53
14	(1-2pm)	20	30	20	25	25	20	on	on	on	35	45	40	51	65	51
15	(2-3pm)	20	30	20	25	25	20	on	on	on	30	40	30	51	65	50
16	(3-4pm)	30	30	20	25	25	20	on	on	on	30	40	30	51	65	44
17	(4-5pm)	50	30	30	25	25	20	on	on	on	30	35	30	63	65	64
18	(5-6pm)	50	50	40	25	25	20	on	on	on	40	40	40	80	75	62
19	(6-7pm)	50	60	40	60	60	50	on	on	on	55	55	50	86	80	65
20	(7-8pm)	70	60	60	80	70	70	on	on	on	60	55	50	70	80	63
21	(8-9pm)	70	60	60	90	70	80	on	on	on	50	50	40	70	75	63
22	(9-10pm)	80	70	80	80	70	60	on	on	on	55	55	50	70	75	63
23	(10-11pm)	90	70	80	60	60	50	on	on	on	45	40	40	45	55	40
24	(11-12am)	90	70	80	30	30	30	on	on	on	25	30	20	45	55	40
Total/Day		1390	1390	1300	855	785	810	2400	2400	2400	915	930	900	1217	1303	1287
Total/Week			96.40	hours		58.70	hours		168.0	hours		64.05	hours		86.75	hours
Total/Year			5026	hours		3061	hours		8760	hours		3340	hours		4523	hours

Wk = Weekday

1. Schedules for occupancy, lighting, receptacle, HVAC system and service hot water are from ASHRAE Standard 90.1-1989 and addendums, except that 5% emergency lighting has been added for all off hours. Elevator schedules, except for restaurants, are from the U.S. Department of Energy Standard Evaluation Techniques except changed to 0% when occupancy is 0%. THESE VALUES MAY BE USED ONLY IF ACTUAL SCHEDULES ARE NOT KNOWN.

TABLE 3.3D

Light Manufacturing Occupancy[1]

Hour of Day (time)		Schedule for Occupancy Percent of Maximum Load			Schedule for Lighting Receptacle Percent of Maximum Load			Schedule for HVAC System			Schedule for Service Hot Water Percent of Maximum Load			Schedule for Elevator Percent of Maximum Load		
		Wk	Sat	Sun	Wk	Sat	Sun	Wk	Sat	Sun	Wk	Sat	Sun	Wk	Sat	Sun
1	(12-1am)	0	0	0	5	5	5	off	off	off	5	5	4	0	0	0
2	(1-2am)	0	0	0	5	5	5	off	off	off	5	5	4	0	0	0
3	(2-3am)	0	0	0	5	5	5	off	off	off	5	5	4	0	0	0

Hour of Day (time)		Schedule for Occupancy Percent of Maximum Load			Schedule for Lighting Receptacle Percent of Maximum Load			Schedule for HVAC System			Schedule for Service Hot Water Percent of Maximum Load			Schedule for Elevator Percent of Maximum Load		
		Wk	Sat	Sun	Wk	Sat	Sun	Wk	Sat	Sun	Wk	Sat	Sun	Wk	Sat	Sun
4	(3-4am)	0	0	0	5	5	5	off	off	off	5	5	4	0	0	0
5	(4-5am)	0	0	0	5	5	5	off	off	off	5	5	4	0	0	0
6	(5-6am)	0	0	0	10	5	5	off	off	off	8	8	7	0	0	0
7	(6-7am)	10	10	5	10	10	5	on	on	off	7	7	4	0	0	0
8	(7-8am)	20	10	5	30	10	5	on	on	off	19	11	4	35	16	0
9	(8-9am)	95	30	5	90	30	5	on	on	off	35	15	4	69	14	0
10	(9-10am)	95	30	5	90	30	5	on	on	off	38	21	4	43	21	0
11	(10-11am)	95	30	5	90	30	5	on	on	off	39	19	4	37	18	0
12	(11-12pm)	95	30	5	90	30	5	on	on	off	47	23	6	43	25	0
13	(12-1pm)	50	10	5	80	15	5	on	on	off	57	20	6	58	21	0
14	(1-2pm)	95	10	5	90	15	5	on	on	off	54	19	9	48	13	0
15	(2-3pm)	95	10	5	90	15	5	on	on	off	34	15	6	37	8	0
16	(3-4pm)	95	10	5	90	15	5	on	on	off	33	12	4	37	4	0
17	(4-5pm)	95	10	5	90	15	5	on	on	off	44	14	4	46	5	0
18	(5-6pm)	30	5	5	50	5	5	on	on	off	26	7	4	62	6	0
19	(6-7pm)	10	5	0	30	5	5	on	off	off	21	7	4	20	0	0
20	(7-8pm)	10	0	0	30	5	5	on	off	off	15	7	4	12	0	0
21	(8-9pm)	10	0	0	20	5	5	on	off	off	17	7	4	4	0	0
22	(9-10pm)	10	0	0	20	5	5	on	off	off	8	9	7	4	0	0
23	(10-11pm)	5	0	0	10	5	5	off	off	off	5	5	4	0	0	0
24	(11-12am)	5	0	0	5	5	5	off	off	off	5	5	4	0	0	0
Total/Day		920	200	60	1040	280	120	1600	1200	0	537	256	113	555	151	0
Total/Week			48.60	hours		56.00	hours		92.00	hours		30.54	hours		29.26	hours
Total/Year			2534	hours		2920	hours		4797	hours		1592	hours		1526	hours

Wk = Weekday

1. Schedules for occupancy, lighting, receptacle, HVAC system and service hot water are from ASHRAE Standard 90.1-1989 and addendums, except that 5% emergency lighting has been added for all off hours. Elevator schedules, except for restaurants, are from the U.S. Department of Energy Standard Evaluation Techniques except changed to 0% when occupancy is 0%. THESE VALUES MAY BE USED ONLY IF ACTUAL SCHEDULES ARE NOT KNOWN.

TABLE 3.3E

Office Occupancy[1]

Hour of Day (time)		Schedule for Occupancy Percent of Maximum Load			Schedule for Lighting Receptacle Percent of Maximum Load			Schedule for HVAC System			Schedule for Service Hot Water Percent of Maximum Load			Schedule for Elevator Percent of Maximum Load		
		Wk	Sat	Sun	Wk	Sat	Sun	Wk	Sat	Sun	Wk	Sat	Sun	Wk	Sat	Sun
1	(12-1am)	0	0	0	5	5	5	off	off	off	5	5	4	0	0	0
2	(1-2am)	0	0	0	5	5	5	off	off	off	5	5	4	0	0	0
3	(2-3am)	0	0	0	5	5	5	off	off	off	5	5	4	0	0	0
4	(3-4am)	0	0	0	5	5	5	off	off	off	5	5	4	0	0	0
5	(4-5am)	0	0	0	5	5	5	off	off	off	5	5	4	0	0	0
6	(5-6am)	0	0	0	10	5	5	off	off	off	8	8	7	0	0	0
7	(6-7am)	10	10	5	10	10	5	on	on	off	7	7	4	0	0	0
8	(7-8am)	20	10	5	30	10	5	on	on	off	19	11	4	35	16	0
9	(8-9am)	95	30	5	90	30	5	on	on	off	35	15	4	69	14	0
10	(9-10am)	95	30	5	90	30	5	on	on	off	38	21	4	43	21	0
11	(10-11am)	95	30	5	90	30	5	on	on	off	39	19	4	37	18	0
12	(11-12pm)	95	30	5	90	30	5	on	on	off	47	23	6	43	25	0
13	(12-1pm)	50	10	5	80	15	5	on	on	off	57	20	6	58	21	0
14	(1-2pm)	95	10	5	90	15	5	on	on	off	54	19	9	48	13	0
15	(2-3pm)	95	10	5	90	15	5	on	on	off	34	15	6	37	8	0
16	(3-4pm)	95	10	5	90	15	5	on	on	off	33	12	4	37	4	0
17	(4-5pm)	95	10	5	90	15	5	on	on	off	44	14	4	46	5	0
18	(5-6pm)	30	5	5	50	5	5	on	on	off	26	7	4	62	6	0
19	(6-7pm)	10	5	0	30	5	5	on	off	off	21	7	4	20	0	0
20	(7-8pm)	10	0	0	30	5	5	on	off	off	15	7	4	12	0	0
21	(8-9pm)	10	0	0	20	5	5	on	off	off	17	7	4	4	0	0
22	(9-10pm)	10	0	0	20	5	5	on	off	off	8	9	7	4	0	0
23	(10-11pm)	5	0	0	10	5	5	off	off	off	5	5	4	0	0	0
24	(11-12am)	5	0	0	5	5	5	off	off	off	5	5	4	0	0	0
Total/Day		920	200	60	1040	280	120	1600	1200	0	537	256	113	555	151	0
Total/Week			48.60	hours		56.00	hours		92.00	hours		30.54	hours		29.26	hours
Total/Year			2534	hours		2920	hours		4797	hours		1592	hours		1526	hours

Wk = Weekday

1. Schedules for occupancy, lighting, receptacle, HVAC system and service hot water are from ASHRAE Standard 90.1-1989 and addendums, except that 5% emergency lighting has been added for all off hours. Elevator schedules, except for restaurants, are from the U.S. Department of Energy Standard Evaluation Techniques except changed to 0% when occupancy is 0%. THESE VALUES MAY BE USED ONLY IF ACTUAL SCHEDULES ARE NOT KNOWN.

TABLE 3.3F
Parking Garage Occupancy[1]

Hour of Day (time)	Schedule for Occupancy Percent of Maximum Load			Schedule for Lighting Receptacle Percent of Maximum Load			Schedule for HVAC System			Schedule for Service Hot Water Percent of Maximum Load			Schedule for Elevator Percent of Maximum Load		
	Wk	Sat	Sun	Wk	Sat	Sun	Wk	Sat	Sun	Wk	Sat	Sun	Wk	Sat	Sun
1 (12-1am)				100	100	100									
2 (1-2am)				100	100	100									
3 (2-3am)				100	100	100									
4 (3-4am)				100	100	100									
5 (4-5am)				100	100	100									
6 (5-6am)				100	100	100									
7 (6-7am)				100	100	100									
8 (7-8am)				100	100	100									
9 (8-9am)				100	100	100									
10 (9-10am)				100	100	100		Based						Included	
11 (10-11am)				100	100	100		on						with	
12 (11-12pm)		N/A		100	100	100		likely			N/A			other	
13 (12-1pm)				100	100	100		use						occupancies	
14 (1-2pm)				100	100	100									
15 (2-3pm)				100	100	100									
16 (3-4pm)				100	100	100									
17 (4-5pm)				100	100	100									
18 (5-6pm)				100	100	100									
19 (6-7pm)				100	100	100									
20 (7-8pm)				100	100	100									
21 (8-9pm)				100	100	100									
22 (9-10pm)				100	100	100									
23 (10-11pm)				100	100	100									
24 (11-12am)				100	100	100									
Total/Day				2400	2400	2400									
Total/Week					168	hours									
Total/Year					8760	hours									

Wk = Weekday

1. Schedules for occupancy, lighting, receptacle, HVAC system and service hot water are from ASHRAE Standard 90.1-1989 and addendums, except that 5% emergency lighting has been added for all off hours. Elevator schedules, except for restaurants, are from the U.S. Department of Energy Standard Evaluation Techniques except changed to 0% when occupancy is 0%. THESE VALUES MAY BE USED ONLY IF ACTUAL SCHEDULES ARE NOT KNOWN.

TABLE 3.3G
Restaurant Occupancy[1]

Hour of Day (time)	Schedule for Occupancy Percent of Maximum Load			Schedule for Lighting Receptacle Percent of Maximum Load			Schedule for HVAC System			Schedule for Service Hot Water Percent of Maximum Load			Schedule for Elevator Percent of Maximum Load		
	Wk	Sat	Sun	Wk	Sat	Sun	Wk	Sat	Sun	Wk	Sat	Sun	Wk	Sat	Sun
1 (12-1am)	15	30	20	15	20	20	on	on	on	20	20	25	0	0	0
2 (1-2am)	15	25	20	15	15	15	on	on	on	15	15	20	0	0	0
3 (2-3am)	5	5	5	15	15	15	on	on	on	15	15	20	0	0	0
4 (3-4am)	0	0	0	15	15	15	off	off	off	0	0	0	0	0	0
5 (4-5am)	0	0	0	15	15	15	off	off	off	0	0	0	0	0	0
6 (5-6am)	0	0	0	20	15	15	off	off	off	0	0	0	0	0	0
7 (6-7am)	0	0	0	40	30	30	off	off	off	0	0	0	0	0	0
8 (7-8am)	5	0	0	40	30	30	on	off	off	60	0	0	0	0	0
9 (8-9am)	5	0	0	60	60	50	on	off	off	55	0	0	0	0	0
10 (9-10am)	5	5	0	60	60	50	on	on	off	45	50	0	0	0	0
11 (10-11am)	20	20	10	90	80	70	on	on	on	40	45	50	0	0	0
12 (11-12pm)	50	45	20	90	80	70	on	on	on	45	50	50	0	0	0
13 (12-1pm)	80	50	25	90	80	70	on	on	on	40	50	40	0	0	0
14 (1-2pm)	70	50	25	90	80	70	on	on	on	35	45	40	0	0	0
15 (2-3pm)	40	35	15	90	80	70	on	on	on	30	40	30	0	0	0
16 (3-4pm)	20	30	20	90	80	70	on	on	on	30	40	30	0	0	0

Hour of Day (time)		Schedule for Occupancy Percent of Maximum Load			Schedule for Lighting Receptacle Percent of Maximum Load			Schedule for HVAC System			Schedule for Service Hot Water Percent of Maximum Load			Schedule for Elevator Percent of Maximum Load		
		Wk	Sat	Sun	Wk	Sat	Sun	Wk	Sat	Sun	Wk	Sat	Sun	Wk	Sat	Sun
17	(4-5pm)	25	30	25	90	80	60	on	on	on	30	35	30	0	0	0
18	(5-6pm)	50	30	35	90	90	60	on	on	on	40	40	40	0	0	0
19	(6-7pm)	80	70	55	90	90	60	on	on	on	55	55	50	0	0	0
20	(7-8pm)	80	90	65	90	90	60	on	on	on	60	55	50	0	0	0
21	(8-9pm)	80	70	70	90	90	60	on	on	on	50	50	40	0	0	0
22	(9-10pm)	50	65	35	90	90	60	on	on	on	55	55	50	0	0	0
23	(10-11pm)	35	55	20	50	50	50	on	on	on	45	40	40	0	0	0
24	(11-12am)	20	35	20	30	30	30	on	on	on	25	30	20	0	0	0
Total/Day		750	740	485	1455	1365	1115	2000	1800	1700	790	730	625	0	0	0
Total/Week			49.75	hours		97.55	hours		135	hours		53.05	hours		0	hours
Total/Year			2594	hours		5086	hours		7039	hours		2766	hours		0	hours

Wk = Weekday

1. Schedules for occupancy, lighting, receptacle, HVAC system and service hot water are from ASHRAE Standard 90.1-1989 and addendums, except that 5% emergency lighting has been added for all off hours. Elevator schedules, except for restaurants, are from the U.S. Department of Energy Standard Evaluation Techniques except changed to 0% when occupancy is 0%. THESE VALUES MAY BE USED ONLY IF ACTUAL SCHEDULES ARE NOT KNOWN.

TABLE 3.3H

Retail Occupancy[1]

Hour of Day (time)		Schedule for Occupancy Percent of Maximum Load			Schedule for Lighting Receptacle Percent of Maximum Load			Schedule for HVAC System			Schedule for Service Hot Water Percent of Maximum Load			Schedule for Elevator Percent of Maximum Load		
		Wk	Sat	Sun	Wk	Sat	Sun	Wk	Sat	Sun	Wk	Sat	Sun	Wk	Sat	Sun
1	(12-1am)	0	0	0	5	5	5	off	off	off	4	11	7	0	0	0
2	(1-2am)	0	0	0	5	5	5	off	off	off	5	10	7	0	0	0
3	(2-3am)	0	0	0	5	5	5	off	off	off	5	8	7	0	0	0
4	(3-4am)	0	0	0	5	5	5	off	off	off	4	6	6	0	0	0
5	(4-5am)	0	0	0	5	5	5	off	off	off	4	6	6	0	0	0
6	(5-6am)	0	0	0	5	5	5	off	off	off	4	6	6	0	0	0
7	(6-7am)	0	0	0	5	5	5	on	on	off	4	7	7	0	0	0
8	(7-8am)	10	10	0	20	10	5	on	on	off	15	20	10	12	9	0
9	(8-9am)	20	20	0	50	30	10	on	on	on	23	24	12	22	21	0
10	(9-10am)	50	50	10	90	60	10	on	on	on	32	27	14	64	56	11
11	(10-11am)	50	60	20	90	90	40	on	on	on	41	42	29	74	66	13
12	(11-12pm)	70	80	20	90	90	40	on	on	on	57	54	31	68	68	35
13	(12-1pm)	70	80	40	90	90	60	on	on	on	62	59	36	68	68	37
14	(1-2pm)	70	80	40	90	90	60	on	on	on	61	60	36	71	69	37
15	(2-3pm)	70	80	40	90	90	60	on	on	on	50	49	34	72	70	39
16	(3-4pm)	80	80	40	90	90	60	on	on	on	45	48	35	72	69	41
17	(4-5pm)	70	80	40	90	90	60	on	on	on	46	47	37	73	66	38
18	(5-6pm)	50	60	20	90	90	40	on	on	off	47	46	34	68	58	34
19	(6-7pm)	50	20	10	60	50	20	on	on	off	42	44	25	68	47	3
20	(7-8pm)	30	20	0	60	30	5	on	on	off	34	36	27	58	43	0
21	(8-9pm)	30	20	0	50	30	5	on	on	off	33	29	21	54	43	0
22	(9-10pm)	0	10	0	20	10	5	off	on	off	23	22	16	0	8	0
23	(10-11pm)	0	0	0	5	5	5	off	off	off	13	16	10	0	0	0
24	(11-12am)	0	0	0	5	5	5	off	off	off	8	13	6	0	0	0
Total/Day		720	750	280	1115	985	525	1500	1600	900	662	690	459	844	761	288
Total/Week			46.30	hours		70.85	hours		100	hours		44.59	hours		52.69	hours
Total/Year			2414	hours		3694	hours		5214	hours		2325	hours		2747	hours

Wk = Weekday

1. Schedules for occupancy, lighting, receptacle, HVAC system and service hot water are from ASHRAE Standard 90.1-1989 and addendums, except that 5% emergency lighting has been added for all off hours. Elevator schedules, except for restaurants, are from the U.S. Department of Energy Standard Evaluation Techniques except changed to 0% when occupancy is 0%. THESE VALUES MAY BE USED ONLY IF ACTUAL SCHEDULES ARE NOT KNOWN.

TABLE 3.3I
School Occupancy[1]

Hour of Day (time)		Schedule for Occupancy Percent of Maximum Load			Schedule for Lighting Receptacle Percent of Maximum Load			Schedule for HVAC System			Schedule for Service Hot Water Percent of Maximum Load			Schedule for Elevator Percent of Maximum Load		
		Wk	Sat	Sun	Wk	Sat	Sun	Wk	Sat	Sun	Wk	Sat	Sun	Wk	Sat	Sun
1	(12-1am)	0	0	0	5	5	5	off	off	off	5	3	3	0	0	0
2	(1-2am)	0	0	0	5	5	5	off	off	off	5	3	3	0	0	0
3	(2-3am)	0	0	0	5	5	5	off	off	off	5	3	3	0	0	0
4	(3-4am)	0	0	0	5	5	5	off	off	off	5	3	3	0	0	0
5	(4-5am)	0	0	0	5	5	5	off	off	off	5	3	3	0	0	0
6	(5-6am)	0	0	0	5	5	5	off	off	off	5	3	3	0	0	0
7	(6-7am)	0	0	0	5	5	5	off	off	off	5	3	3	0	0	0
8	(7-8am)	5	0	0	30	5	5	on	off	off	10	3	3	0	0	0
9	(8-9am)	75	10	0	85	15	5	on	on	off	34	3	5	30	0	0
10	(9-10am)	90	10	0	95	15	5	on	on	off	60	5	5	30	0	0
11	(10-11am)	90	10	0	95	15	5	on	on	off	63	5	5	30	0	0
12	(11-12pm)	80	10	0	95	15	5	on	on	off	72	5	5	30	0	0
13	(12-1pm)	80	10	0	80	15	5	on	on	off	79	5	5	30	0	0
14	(1-2pm)	80	0	0	80	5	5	on	off	off	83	3	5	30	0	0
15	(2-3pm)	80	0	0	80	5	5	on	off	off	61	3	3	30	0	0
16	(3-4pm)	45	0	0	70	5	5	on	off	off	65	3	3	15	0	0
17	(4-5pm)	15	0	0	50	5	5	on	off	off	10	3	3	0	0	0
18	(5-6pm)	5	0	0	50	5	5	on	off	off	10	3	3	0	0	0
19	(6-7pm)	15	0	0	35	5	5	on	off	off	19	3	3	0	0	0
20	(7-8pm)	20	0	0	35	5	5	on	off	off	25	3	3	0	0	0
21	(8-9pm)	20	0	0	35	5	5	on	off	off	22	3	3	0	0	0
22	(9-10pm)	10	0	0	30	5	5	on	off	off	22	3	3	0	0	0
23	(10-11pm)	0	0	0	5	5	5	off	off	off	12	3	3	0	0	0
24	(11-12am)	0	0	0	5	5	5	off	off	off	9	3	3	0	0	0
Total/Day		710	50	0	990	170	120	1500	500	0	691	80	84	285	0	0
Total/Week			36.00	hours		52.40	hours		80.00	hours		36.19	hours		14.25	hours
Total/Year			1877	hours		2732	hours		4171	hours		1887	hours		743	hours

Wk = Weekday

1. Schedules for occupancy, lighting, receptacle, HVAC system and service hot water are from ASHRAE Standard 90.1-1989 and addendums, except that 5% emergency lighting has been added for all off hours. Elevator schedules, except for restaurants, are from the U.S. Department of Energy Standard Evaluation Techniques except changed to 0% when occupancy is 0%. THESE VALUES MAY BE USED ONLY IF ACTUAL SCHEDULES ARE NOT KNOWN.

TABLE 3.3J
Warehouse Occupancy[1]

Hour of Day (time)		Schedule for Occupancy Percent of Maximum Load			Schedule for Lighting Receptacle Percent of Maximum Load			Schedule for HVAC System			Schedule for Service Hot Water Percent of Maximum Load			Schedule for Elevator Percent of Maximum Load		
		Wk	Sat	Sun	Wk	Sat	Sun	Wk	Sat	Sun	Wk	Sat	Sun	Wk	Sat	Sun
1	(12-1am)	0	0	0	5	5	5	off	off	off	2	2	2	0	0	0
2	(1-2am)	0	0	0	5	5	5	off	off	off	2	2	2	0	0	0
3	(2-3am)	0	0	0	5	5	5	off	off	off	2	2	2	0	0	0
4	(3-4am)	0	0	0	5	5	5	off	off	off	2	2	2	0	0	0
5	(4-5am)	0	0	0	5	5	5	off	off	off	5	2	2	0	0	0
6	(5-6am)	0	0	0	5	5	5	off	off	off	7	2	2	0	0	0
7	(6-7am)	0	0	0	5	5	5	off	off	off	7	2	2	0	0	0
8	(7-8am)	15	0	0	40	5	5	on	off	off	10	2	2	0	0	0
9	(8-9am)	70	20	0	70	8	5	on	on	off	30	6	2	0	0	0
10	(9-10am)	90	20	0	90	24	5	on	on	off	36	12	2	0	0	0
11	(10-11am)	90	20	0	90	24	5	on	on	off	36	12	2	30	0	0
12	(11-12pm)	90	20	0	90	24	5	on	on	off	46	17	2	0	0	0
13	(12-1pm)	50	10	0	80	5	5	on	on	off	57	4	4	0	0	0
14	(1-2pm)	85	10	0	90	5	5	on	on	off	43	4	4	0	0	0
15	(2-3pm)	85	10	0	90	5	5	on	on	off	38	2	2	0	0	0
16	(3-4pm)	85	10	0	90	5	5	on	on	off	40	2	2	40	0	0
17	(4-5pm)	20	0	0	90	5	5	on	off	off	30	2	2	0	0	0
18	(5-6pm)	0	0	0	30	5	5	off	off	off	18	2	2	0	0	0
19	(6-7pm)	0	0	0	5	5	5	off	off	off	3	2	2	0	0	0
20	(7-8pm)	0	0	0	5	5	5	off	off	off	3	2	2	0	0	0
21	(8-9pm)	0	0	0	5	5	5	off	off	off	3	2	2	0	0	0
22	(9-10pm)	0	0	0	5	5	5	off	off	off	3	2	2	0	0	0

Hour of Day (time)	Schedule for Occupancy Percent of Maximum Load			Schedule for Lighting Receptacle Percent of Maximum Load			Schedule for HVAC System			Schedule for Service Hot Water Percent of Maximum Load			Schedule for Elevator Percent of Maximum Load		
	Wk	Sat	Sun	Wk	Sat	Sun	Wk	Sat	Sun	Wk	Sat	Sun	Wk	Sat	Sun
23 (10-11pm)	0	0	0	5	5	5	off	off	off	3	2	2	0	0	0
24 (11-12am)	0	0	0	5	5	5	off	off	off	3	2	2	0	0	0
Total/Day	680	120	0	915	180	120	1000	800	0	429	91	52	70	0	0
Total/Week		35.20	hours		48.75	hours		58.00	hours		22.88	hours		3.50	hours
Total/Year		1835	hours		2542	hours		3024	hours		1193	hours		182	hours

Wk = Weekday

1. Schedules for occupancy, lighting, receptacle, HVAC system and service hot water are from ASHRAE Standard 90.1-1989 and addendums, except that 5% emergency lighting has been added for all off hours. Elevator schedules, except for restaurants, are from the U.S. Department of Energy Standard Evaluation Techniques except changed to 0% when occupancy is 0%. THESE VALUES MAY BE USED ONLY IF ACTUAL SCHEDULES ARE NOT KNOWN.

[Statutory Authority: RCW 19.27A.025, 19.27A.045. 10-03-115, 10-13-113 and 10-22-056, § 51-11-99903, filed 1/20/10, 6/21/10 and 10/28/10, effective 1/1/11; 01-03-010, § 51-11-99903, filed 1/5/01, effective 7/1/01; 98-03-003, § 51-11-99903, filed 1/8/98, effective 7/1/98. Statutory Authority: RCW 19.27A.025. 93-21-052, § 51-11-99903, filed 10/18/93, effective 4/1/94.]

Reviser's note: The brackets and enclosed material in the text of the above section occurred in the copy filed by the agency.

Reviser's note: Notice of Objection: The Joint Administrative Rules Review Committee (Committee) finds that, in adopting the 2009 proposed changes to the State Energy Code, Chapter 51-11 WAC, on November 20, 2009, the State Building Code Council (Council) failed to comply with all requirements of the law and failed to adequately respond to the Committee's request for additional economic impact and cost-benefit analyses prior to adoption.

On October 1, 2009, the Committee found that the Small Business Economic Impact Statement (SBEIS) for the proposed changes filed with the Code Reviser failed to comply with all requirements of law. The Committee requested that the Council conduct a cost-benefit analysis pursuant to RCW 34.05.328 and amend the SBEIS to provide additional economic impact information, including an estimate of the number of jobs that would be created or lost as a result of compliance with all the proposed rules, as required by RCW 19.85.040 (2)(d).

The Council provided the Committee with information and data on November 18, 2009. On December 2, 2009, the Committee found that the Council failed to adequately respond to the Committee's request for additional data. Specifically, the Committee found that the Council failed to amend the SBEIS to (a) estimate the number of jobs that would be created or lost as a result of compliance with the proposed changes; and (b) support the SBEIS with a detailed and rigorous costs analysis of the cumulative impact of all the changes. In addition, the Committee found that the Council failed to provide the Committee with a cost-benefit analysis of the proposed changes and pursuant to the requirements of RCW 34.05.328.

The Committee strongly supports a process that makes thoughtful and informed progress towards changes that result in improved energy efficiency in our buildings, wherever practicable. While the Council worked diligently, it is the opinion of the Committee that the Council did not fully develop and consider the economic impacts and costs versus benefits of these significant changes to our Energy Code. Furthermore, it is the opinion of the Committee that the Council and the Legislature need this information to fully evaluate the value, impacts, and consequences of the proposed codes, with due diligence to their respective fiduciary responsibilities, in order to create the best informed public policy.

As a result, the Committee recommends that the Governor suspend the adoption and implementation of the changes to the Energy Code, Chapter 51-11 WAC, adopted by the Council on November 20, 2009, until such time as a more adequate analysis has been completed and considered by the appropriate bodies.

For all of the above stated reasons, the Committee objects to the changes to the State Energy Code, Chapter 51-11 WAC, that were adopted by the Council on November 20, 2009, and hereby directs the Code Reviser, pursuant to RCW 34.05.640(4), to publish this Notice of Objection in the Washington State Register and along with any publication in the Washington Administrative Code of changes to Chapter 51-11 WAC that were adopted by the Council in 2009 and filed with the Code Reviser.

WAC 51-11-99904 Section 4—Suggested software for systems analysis approach.

Program Name	Source
DOE 2.1E	Energy Science and Technology Software Center (ESTSC) PO Box 1220 Oakridge, TN 37831-1020 423-576-2606
DOE 2.1E or DOE 2.2	James J. Hirsch & Associates Building Performance Analysis Software & Consulting 12185 Presilla Road Camarillo, CA 93012-9243 (805) 532-1045
EnergyPlus	Kathy Ellington Lawrence Berkeley National Laboratory (LBNL) Building 90, Room 3147 Berkeley, CA 94720-0001 (510) 486-5711
ESAS	Ross Meriweather Consulting, Engineering 3315 Outrider San Antonio, TX 78247-4405 210-490-7081
ESP-II	Automated Procedures for Engineering Consultants, Inc. 40 W. 4th Centre, Suite 2100 Dayton, OH 45402 937-228-2602
HAP 3.24	Carrier Building Systems and Services 3215 South 116th St., Suite 133 Tukwila, WA 98168 (206)-439-0097
Trace 600 Version 18.11 or Trace 700	The Trane Co. 3600 Pammel Creek Rd. Lacrosse, WI 54601 608-787-3926

[Statutory Authority: RCW 19.27A.025, 19.27A.045. 10-03-115, 10-13-113 and 10-22-056, § 51-11-99904, filed 1/20/10, 6/21/10 and 10/28/10, effective 1/1/11; 01-03-010, § 51-11-99904, filed 1/5/01, effective 7/1/01; 98-03-003, § 51-11-99904, filed 1/8/98, effective 7/1/98. Statutory Authority: RCW 19.27A.025. 93-21-052, § 51-11-99904, filed 10/18/93, effective 4/1/94.]

Reviser's note: Notice of Objection: The Joint Administrative Rules Review Committee (Committee) finds that, in adopting the 2009 proposed changes to the State Energy Code, Chapter 51-11 WAC, on November 20, 2009, the State Building Code Council (Council) failed to comply with all requirements of the law and failed to adequately respond to the Committee's request for additional economic impact and cost-benefit analyses prior to adoption.

On October 1, 2009, the Committee found that the Small Business Economic Impact Statement (SBEIS) for the proposed changes filed with the Code Reviser failed to comply with all requirements of law. The Committee requested that the Council conduct a cost-benefit analysis pursuant to RCW 34.05.328 and amend the SBEIS to provide additional economic impact information, including an estimate of the number of jobs that would be created or lost as a result of compliance with all the proposed rules, as required by RCW 19.85.040 (2)(d).

The Council provided the Committee with information and data on November 18, 2009. On December 2, 2009, the Committee found that the Council failed to adequately respond to the Committee's request for additional data. Specifically, the Committee found that the Council failed to amend the SBEIS to (a) estimate the number of jobs that would be created or lost as a result of compliance with the proposed changes; and (b) support the SBEIS with a detailed and rigorous costs analysis of the cumulative impact of all the changes. In addition, the Committee found that the Council failed to provide the Committee with a cost-benefit analysis of the proposed changes and pursuant to the requirements of RCW 34.05.328.

The Committee strongly supports a process that makes thoughtful and informed progress towards changes that result in improved energy efficiency in our buildings, wherever practicable. While the Council worked diligently, it is the opinion of the Committee that the Council did not fully develop and consider the economic impacts and costs versus benefits of these significant changes to our Energy Code. Furthermore, it is the opinion of the Committee that the Council and the Legislature need this information to fully evaluate the value, impacts, and consequences of the proposed codes, with due diligence to their respective fiduciary responsibilities, in order to create the best informed public policy.

As a result, the Committee recommends that the Governor suspend the adoption and implementation of the changes to the Energy Code, Chapter 51-11 WAC, adopted by the Council on November 20, 2009, until such time as a more adequate analysis has been completed and considered by the appropriate bodies.

For all of the above stated reasons, the Committee objects to the changes to the State Energy Code, Chapter 51-11 WAC, that were adopted by the Council on November 20, 2009, and hereby directs the Code Reviser, pursuant to RCW 34.05.640(4), to publish this Notice of Objection in the Washington State Register and along with any publication in the Washington Administrative Code of changes to Chapter 51-11 WAC that were adopted by the Council in 2009 and filed with the Code Reviser.

Chapter 51-50 WAC

STATE BUILDING CODE ADOPTION AND AMENDMENT OF THE 2009 EDITION OF THE INTERNATIONAL BUILDING CODE

(Formerly chapter 51-40 WAC)

WAC

51-50-003 International Building Code.
51-50-007 Exceptions.
51-50-008 Implementation.
51-50-0108 Temporary structures and uses.
51-50-0200 Chapter 2—Definitions.
51-50-0305 Section 305—Educational Group E.
51-50-0308 Section 308—Institutional Group I.
51-50-0310 Section 310—Residential Group R.
51-50-0403 Section 403—High-rise buildings.
51-50-0406 Reserved.
51-50-0407 Reserved.
51-50-0420 Section 420—Groups I-1, R-1, R-2, R-3.
51-50-0422 Section 422—Ambulatory health care.
51-50-0502 Reserved.
51-50-0504 Section 504—Height.
51-50-0506 Building area modifications.
51-50-0509 Reserved.
51-50-0708 Section 708—Shaft enclosures.
51-50-0710 Section 710—Smoke barriers.
51-50-0903 Section 903—Automatic sprinkler systems.
51-50-0907 Section 907—Fire alarm and detection systems.
51-50-0909 Section 909—Smoke control systems.
51-50-0911 Section 911—Fire command center.
51-50-1005 Section 1005—Egress width.
51-50-1007 Section 1007—Accessible means of egress.
51-50-1008 Section 1008—Doors, gates and turnstiles.
51-50-1009 Section 1009—Stairways and handrails.
51-50-10100 Section 1010—Ramps.
51-50-1014 Exit access.
51-50-1015 Reserved.
51-50-1018 Section 1018—Corridors.
51-50-1019 Reserved.
51-50-1106 Section 1106—Parking and passenger loading facilities.
51-50-1203 Section 1203—Ventilation.
51-50-1208 Section 1208—Interior space dimensions.
51-50-1403 Section 1403—Performance requirements.
51-50-1405 Section 1405—Installation of wall coverings.
51-50-1602 Reserved.
51-50-1607 Reserved.
51-50-1609 Section 1609—Wind loads.
51-50-1613 Reserved.
51-50-1715 Section 1715—Preconstruction load tests.
51-50-2104 Section 2104—Construction.
51-50-2106 Reserved.
51-50-21070 Section 2107—Allowable stress design.
51-50-2108 Section 2108—Strength design of masonry.
51-50-2111 Section 2111—Masonry fireplaces.
51-50-2400 Chapter 24—Glass and glazing.
51-50-2900 Chapter 29—Minimum plumbing fixtures and sanitation facilities.
51-50-3001 Reserved.
51-50-3108 Section 3108—Telecommunications and broadcast towers.
51-50-3401 Section 3401—General.
51-50-3404 Section 3404—Alterations.
51-50-3410 Section 3410—Moved structures.
51-50-3411 Section 3411—Accessibility for existing buildings.
51-50-480000 2009 International Existing Building Code.
51-50-480101 Section 101—General.
51-50-480102 Section 102—Applicability.
51-50-480302 Reserved.
51-50-480305 Reserved.
51-50-480307 Section 307—Change of occupancy.
51-50-480506 Reserved.
51-50-480607 Section 607—Energy conservation.
51-50-480711 Section 711—Energy conservation.
51-50-480807 Section 807—Structural.
51-50-480808 Section 808—Energy conservation.
51-50-481101 Chapter 11—Historic buildings—Section 1101—General.
51-50-481102 Reserved.
51-50-481104 Alterations.
51-50-481106 Reserved.
51-50-481201 Section 1201—General.
51-50-481301 Reserved.
51-50-481500 Reserved.

DISPOSITION OF SECTIONS FORMERLY CODIFIED IN THIS CHAPTER

51-50-004 Conflicts with Washington State Ventilation and Indoor Air Quality Code. [Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-108, § 51-50-004, filed 12/17/03, effective 7/1/04.] Repealed by 10-03-097, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.031 and 19.27.074.

51-50-0107 Temporary structures and uses. [Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 70.92, 19.27, and 34.05 RCW. 07-01-091, § 51-50-0107, filed 12/19/06, effective 7/1/07.] Decodified and amended by 10-03-097, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.031 and 19.27.074. Recodified as WAC 51-50-0108.

51-50-0707 Section 707—Shaft enclosures. [Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 70.92, 19.27, and 34.05 RCW. 07-01-091, § 51-50-0707, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-108, § 51-50-0707, filed 12/17/03, effective 7/1/04.] Decodified and amended by 10-03-097, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.031 and 19.27.074. Recodified as WAC 51-50-0708.

51-50-1017 Corridors. [Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 70.92, 19.27, and 34.05 RCW.

07-01-091, § 51-50-1017, filed 12/19/06, effective 7/1/07.] Decodified and amended by 10-03-097, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.031 and 19.27.074. Recodified as WAC 51-50-1018.

51-50-1714 Section 1714—Preconstruction load tests. [Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 70.92, 19.27, and 34.05 RCW. 07-01-091, § 51-50-1714, filed 12/19/06, effective 7/1/07.] Decodified and amended by 10-03-097, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.031 and 19.27.074. Recodified as WAC 51-50-1715.

51-50-3408 Section 3408—Moved structures. [Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-108, § 51-50-3408, filed 12/17/03, effective 7/1/04.] Decodified and amended by 10-03-097, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.031 and 19.27.074. Recodified as WAC 51-50-3410.

51-50-3409 Section 3409—Accessibility for existing buildings. [Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 70.92, 19.27, and 34.05 RCW. 07-01-091, § 51-50-3409, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-108, § 51-50-3409, filed 12/17/03, effective 7/1/04.] Decodified and amended by 10-03-097, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.031 and 19.27.074. Recodified as WAC 51-50-3411.

WAC 51-50-003 International Building Code. The 2009 edition of the *International Building Code*, including Appendix E, published by the International Code Council is hereby adopted by reference with the exceptions noted in this chapter of the Washington Administrative Code.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 10-03-097, § 51-50-003, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 70.92, 19.27, and 34.05 RCW. 07-01-091, § 51-50-003, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.020, 19.27.031, 19.27.074 and chapters 19.27 and 34.05 RCW. 05-01-014, § 51-50-003, filed 12/2/04, effective 7/1/05. Statutory Authority: RCW 19.27.190, 19.27.020, and chapters 19.27 and 34.05 RCW. 04-18-033, § 51-50-003, filed 8/25/04, effective 9/25/04. Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-108, § 51-50-003, filed 12/17/03, effective 7/1/04.]

WAC 51-50-007 Exceptions. The exceptions and amendments to the International Building Code contained in the provisions of chapter 19.27 RCW shall apply in case of conflict with any of the provisions of these rules.

The provisions of this code do not apply to temporary growing structures used solely for the commercial production of horticultural plants including ornamental plants, flowers, vegetables, and fruits. "Temporary growing structure" means a structure that has the sides and roof covered with polyethylene, polyvinyl, or similar flexible synthetic material and is used to provide plants with either frost protection or increased heat retention. A temporary growing structure is not considered a building for purposes of this code.

The provisions of this code do not apply to the construction, alteration, or repair of temporary worker housing except as provided by rule adopted under chapter 70.114A RCW or chapter 37, Laws of 1998 (SB 6168). "Temporary worker housing" means a place, area, or piece of land where sleeping places or housing sites are provided by an employer for his or her employees or by another person, including a temporary worker housing operator, who is providing such accommodations for employees, for temporary, seasonal occupancy, and includes "labor camps" under RCW 70.54.110.

Codes referenced which are not adopted through RCW 19.27.031 or chapter 19.27A RCW shall not apply unless specifically adopted by the authority having jurisdiction. The 2009 International Existing Building Code is included in the adoption of this code in Section 3401.5 and amended in WAC 51-50-480000.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 10-03-097, § 51-50-007, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 70.92, 19.27, and 34.05 RCW. 07-01-091, § 51-50-007, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-108, § 51-50-007, filed 12/17/03, effective 7/1/04.]

WAC 51-50-008 Implementation. The International Building Code adopted under chapter 51-50 WAC shall become effective in all counties and cities of this state on July 1, 2010.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 10-03-097, § 51-50-008, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 70.92, 19.27, and 34.05 RCW. 07-01-091, § 51-50-008, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-108, § 51-50-008, filed 12/17/03, effective 7/1/04.]

WAC 51-50-0108 Temporary structures and uses.

108.1 General. The building official is authorized to issue a permit for temporary structures and temporary uses. Such permits shall be limited as to time of service, but shall not be permitted for more than 180 days. The building official is authorized to grant extensions for demonstrated cause.

EXCEPTION: The building official may authorize unheated tents and yurts under 500 square feet accommodating an R-1 Occupancy for recreational use as a temporary structure and allow them to be used indefinitely.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 10-03-097, amended and recodified as § 51-50-0108, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 70.92, 19.27, and 34.05 RCW. 07-01-091, § 51-50-0107, filed 12/19/06, effective 7/1/07.]

WAC 51-50-0200 Chapter 2—Definitions.

SECTION 202—DEFINITIONS.

ADULT FAMILY HOME. See Section 310.2.

AIR-PERMEABLE INSULATION. An insulation having an air permeance equal to or less than 0.02 L/s-m^2 at 75 Pa pressure differential tested in accordance with ASTM E2178 or ASTM E283.

CHILD DAY CARE. See Section 310.2.

CHILD DAY CARE HOME, FAMILY. See Section 310.2.

NIGHTCLUB. An A-2 Occupancy use under the 2006 International Building Code in which the aggregate area of concentrated use of unfixed chairs and standing space that is specifically designated and primarily used for dancing or viewing performers exceeds three hundred fifty square feet, excluding adjacent lobby areas. "Nightclub" does not include theaters with fixed seating, banquet halls, or lodge halls.

PORTABLE SCHOOL CLASSROOM. See Section 902.1.

RESIDENTIAL CARE/ASSISTED LIVING FACILITIES. See Section 310.2. This definition is not adopted.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 10-03-097, § 51-50-0200, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.190, 19.27.020, and chapters 19.27 and 34.05 RCW. 08-01-110, § 51-50-0200, filed 12/18/07, effective 4/1/08. Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 70.92, 19.27, and 34.05 RCW. 07-01-091, § 51-50-0200, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.020,

19.27.031, 19.27.074, and chapters 19.27 and 34.05 RCW. 05-24-070, § 51-50-0200, filed 12/5/05, effective 7/1/06. Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-108, § 51-50-0200, filed 12/17/03, effective 7/1/04.]

WAC 51-50-0305 Section 305—Educational Group E.

305.2 Day Care. The use of a building or structure, or portion thereof, for educational, supervision or personal care services for more than five children older than 2 1/2 years of age, shall be classified as a Group E Occupancy.

EXCEPTION: Family child day care homes licensed by Washington state for the care of twelve or fewer children shall be classified as Group R-3.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 10-03-097, § 51-50-0305, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-108, § 51-50-0305, filed 12/17/03, effective 7/1/04.]

WAC 51-50-0308 Section 308—Institutional Group I.

308.1 Institutional Group I. Institutional Group I Occupancy includes, among others, the use of a building or structure, or a portion thereof, in which people are cared for or live in a supervised environment, having physical limitations because of health or age are harbored for medical treatment or other care or treatment, or in which people are detained for penal or correctional purposes or in which the liberty of the occupants is restricted. Institutional occupancies shall be classified as Group I-1, I-2, I-3 or I-4.

308.2 Group I-1. This occupancy shall include buildings, structures or parts thereof housing more than 16 persons, on a 24-hour basis, who because of age, mental disability or other reasons, live in a supervised residential environment that provides personal care services. The occupants are capable of responding to an emergency situation without physical assistance from staff. This group shall include, but not be limited to, the following:

Residential board and care facilities
Assisted living facilities
Halfway houses
Group homes
Congregate care facilities
Social rehabilitation facilities
Alcohol and drug centers
Convalescent facilities

A facility such as the above with five or fewer persons and adult family homes licensed by Washington state shall be classified as a Group R-3 or shall comply with the *International Residential Code* in accordance with Section 101.2.

A facility such as the above, providing licensed care to clients in one of the categories listed in Section 310.1 licensed by Washington state shall be classified as Group R-2.

308.3 Group I-2. This occupancy shall include buildings and structures used for medical, surgical, psychiatric, nursing or custodial care for persons who are not capable of self-preservation. This group shall include, but not be limited to, the following:

Child care facilities
Detoxification facilities
Hospice care centers
Hospitals
Mental hospitals
Nursing homes

A facility such as the above providing licensed care to clients in one of the categories listed in Section 310.1 licensed by Washington state shall be classified as Group R-2.

308.3.1 Definitions. The following words and terms shall, for the purposes of this section and as used elsewhere in this code, have the meanings shown herein.

CHILD CARE FACILITIES. Facilities that provide care on a 24-hour basis to more than five children, 2 1/2 years of age or less, shall be classified as Group I-2.

DETOXIFICATION FACILITY. Facilities that serve patients who are provided treatment for substance abuse on a 24-hour basis and who are incapable of self-preservation or who are harmful to themselves or others.

HOSPITALS AND MENTAL HOSPITALS. A building or portion thereof used on a 24-hour basis for the medical, psychiatric, obstetrical or surgical treatment of inpatients who are incapable of self-preservation.

NURSING HOMES. Nursing homes are long-term care facilities on a 24-hour basis, including both intermediate care facilities and skilled nursing facilities, serving more than five persons and any of the persons are incapable of self-preservation.

HOSPICE CARE CENTER. A building or portion thereof used on a 24-hour basis for the provision of hospice services to terminally ill inpatients.

308.5.2 Child care facility. A facility that provides supervision and personal care on a less than 24-hour basis for more than five children 2 1/2 years of age or less shall be classified as Group I-4.

EXCEPTIONS:
1. A child day care facility that provides care for more than five but no more than 100 children 2 1/2 years or less of age, where the rooms in which the children are cared for are located on a level of exit discharge serving such rooms and each of these child care rooms has an exit door directly to the exterior, shall be classified as Group E.
2. Family child day care homes licensed by Washington state for the care of twelve or fewer children shall be classified as Group R-3.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 10-03-097, § 51-50-0308, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 70.92, 19.27, and 34.05 RCW. 07-01-091, § 51-50-0308, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-108, § 51-50-0308, filed 12/17/03, effective 7/1/04.]

WAC 51-50-0310 Section 310—Residential Group R.

310.1 Residential Group R. Residential Group R includes, among others, the use of a building or structure, or a portion thereof, for sleeping purposes when not classified as an Institutional Group I or when not regulated by the International Residential Code in accordance with Section 101.2. Residential occupancies shall include the following:

R-1 Residential occupancies containing sleeping units where the occupants are primarily transient in nature, including:

Boarding houses (transient)
Hotels (transient)
Motels (transient)
Congregate living facilities (transient) with 10 or fewer occupants are permitted to comply with the construction requirements for Group R-3.

R-2 Residential occupancies containing sleeping units or more than two dwelling units where the occupants are primarily permanent in nature, including:
Apartment houses
Boarding houses (not transient)
Boarding homes as licensed by Washington state under chapter 388-78A WAC
Convents
Dormitories
Fraternities and sororities
Hotels (nontransient)
Live/work units
Monasteries
Motels (nontransient)
Residential treatment facilities as licensed by Washington state under chapter 246-337 WAC
Vacation timeshare properties
Congregate living facilities with sixteen or fewer occupants are permitted to comply with the construction requirements for Group R-3.

R-3 Residential occupancies where the occupants are primarily permanent in nature and not classified as Group R-1, R-2, R-4 or I, including: Buildings that do not contain more than two dwelling units. Adult care facilities that provide accommodations for five or fewer persons of any age for less than 24 hours. Child care facilities that provide accommodations for five or fewer persons of any age for less than 24 hours. Congregate living facilities with sixteen or fewer persons. Adult care within a single-family home, adult family homes and family child day care homes are permitted to comply with the International Residential Code.

Foster family care homes licensed by Washington state are permitted to comply with the *International Residential Code*, as an accessory use to a dwelling, for six or fewer children including those of the resident family.

R-4 classification is not adopted. Any reference in this code to R-4 does not apply.

310.2 Definitions. The following words and terms shall, for the purposes of this section and as used elsewhere in this code, have the meanings shown herein.

ADULT FAMILY HOME. A dwelling, licensed by Washington state, in which a person or persons provide personal care, special care, room and board to more than one but not more than six adults who are not related by blood or marriage to the person or persons providing the services.

BOARDING HOUSE. A building arranged or used for lodging for compensation, with or without meals, and not occupied as a single family unit.

CHILD DAY CARE. For the purposes of these regulations, is the care of children during any period of a 24-hour day.

CHILD DAY CARE HOME, FAMILY. A child day care facility, licensed by Washington state, located in the dwelling of the person or persons under whose direct care and supervision the child is placed, for the care of twelve or fewer children, including children who reside at the home.

CONGREGATE LIVING FACILITIES. A building or part thereof that contains sleeping units where residents share bathroom and/or kitchen facilities.

DORMITORY. A space in a building where group sleeping accommodations are provided in one room, or in a series of closely associated rooms, for persons not members of the same family group, under joint occupancy and single management, as in college dormitories or fraternity houses.

PERSONAL CARE SERVICE. The care of residents who do not require chronic or convalescent medical or nursing care. Personal care involves responsibility for safety of the resident while inside the building.

RESIDENTIAL CARE/ASSISTED LIVING FACILITIES. This definition is not adopted.

TRANSIENT. Occupancy of a dwelling or sleeping unit for not more than 30 days.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 10-03-097, § 51-50-0310, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.190, 19.27.020, and chapters 19.27 and 34.05 RCW. 08-01-110, § 51-50-0310, filed 12/18/07, effective 4/1/08. Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 70.92, 19.27, and 34.05 RCW. 07-01-091, § 51-50-0310, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-108, § 51-50-0310, filed 12/17/03, effective 7/1/04.]

WAC 51-50-0403 Section 403—High-rise buildings.

403.5.4 Smokeproof exit enclosures. Every required exit stairway serving floors more than 75 feet (22,860 mm) above the lowest level of fire department vehicle access shall comply with Sections 909.20 and 1022.9.

EXCEPTION: Unless required by other sections of this code, portions of such stairways which extend to serve floors below the level of exit discharge need not comply with Sections 909.20 and 1022.9 provided the portion of the stairway below is separated from the level of exit discharge with a 1 hour fire barrier.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 10-03-097, § 51-50-0403, filed 1/20/10, effective 7/1/10.]

WAC 51-50-0406 Reserved.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 10-03-097, § 51-50-0406, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 70.92, 19.27, and 34.05 RCW. 07-01-091, § 51-50-0406, filed 12/19/06, effective 7/1/07.]

WAC 51-50-0407 Reserved.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 10-03-097, § 51-50-0407, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 70.92, 19.27, and 34.05 RCW. 07-01-091, § 51-50-0407, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.020, 19.27.031, 19.27.074 and chapters 19.27 and 34.05 RCW. 05-01-014, § 51-50-0407, filed 12/2/04, effective 7/1/05.]

WAC 51-50-0420 Section 420—Groups I-1, R-1, R-2, R-3.

420.4 Subdivision of building spaces—Smoke barriers. Smoke barriers complying with Section 710 shall be installed on floors other than the level of exit discharge of a Group R-2 boarding home or residential treatment facility licensed by Washington state, where a fire-resistance rated corridor is required by Table 1018.1. The smoke barrier shall subdivide the floor into at least two compartments complying with Section 407.4.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 10-03-097, § 51-50-0420, filed 1/20/10, effective 7/1/10.]

WAC 51-50-0422 Section 422—Ambulatory health care.

422.1 General. Occupancies classified as ambulatory health care facilities shall comply with the provisions of Sections 422.1 through 422.7 and other applicable provisions of this code by the services provided.

422.2 Separation. Ambulatory health care facilities where four or more care recipients are rendered incapable of self-preservation at any given time shall be separated from adjacent spaces, corridors or tenants with a fire partition installed in accordance with Section 709.

422.3 Smoke compartments. Where the aggregate area of one or more ambulatory health care facility exceeds 10,000 square feet on one story, the story shall be provided with a smoke barrier to subdivide the story into not less than two smoke compartments. Smoke barriers shall be installed in accordance with Section 710. The area of any one such smoke compartment shall not exceed 22,500 square feet (2092 m^2). The travel distance from any point in a smoke compartment to a smoke barrier door shall not exceed 200 feet (60,960 mm).

EXCEPTION: Where the ambulatory health care facility is completely surrounded by the required smoke barrier, such smoke barriers shall not be required to be continuous from an outside wall to outside wall.

422.4 Refuge area. At least 15 net square feet (2.8 m^2) per occupant shall be provided within the aggregate area of corridors, patient rooms, treatment rooms, lounge or dining areas and other low-hazard areas on each side of each smoke barrier. Each ambulatory health care facility shall be provided with access to the required refuge areas without passing through or utilizing adjacent tenant spaces.

422.5 Independent egress. A means of egress shall be provided from each smoke compartment created by smoke barriers without having to return through the smoke compartment from which means of egress originated.

422.6 Automatic sprinkler systems. Automatic sprinkler systems shall be provided for ambulatory care facilities in accordance with Section 903.2.2.

422.7 Fire alarm systems. A fire alarm system shall be provided for ambulatory health care facilities in accordance with Section 907.2.2.1.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 10-03-097, § 51-50-0422, filed 1/20/10, effective 7/1/10.]

WAC 51-50-0502 Reserved.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 10-03-097, § 51-50-0502, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 70.92, 19.27, and 34.05 RCW. 07-01-091, § 51-50-0502, filed 12/19/06, effective 7/1/07.]

WAC 51-50-0504 Section 504—Height.

504.3 Stair enclosure pressurization increase. For Group R1 and R2 occupancies in buildings of Type VA construction equipped throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.1, the maximum number of stories permitted in Section 504.2 may be increased by one provided the interior exit stairways and ramps are pressurized in accordance with Section 909.20 and Section 909.11.

504.4 Roof structures. (Same as 2009 IBC except Section number revised)

[Statutory Authority: Chapter 19.27 RCW. 10-24-059, § 51-50-0504, filed 11/29/10, effective 7/1/11.]

WAC 51-50-0506 Building area modifications.

506.4 Single occupancy buildings with more than one story. The total allowable building area of a single occupancy building with more than one story above grade plane shall be determined in accordance with this section. The actual aggregate building area at all stories in the building shall not exceed the total allowable building area.

EXCEPTION: Basements below the first story above grade plane need not be included in the total allowable building area, provided each basement does not exceed the area permitted for a building with no more than one story above grade plane.

506.5 Mixed occupancy area determination. The total allowable building area for buildings containing mixed occupancies shall be determined in accordance with the applicable provisions of this section. Basements below the first story above grade plane need not be included in the total allowable building area, provided each such basement does not exceed the area permitted for a building with no more than one story above grade plane.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 10-03-097, § 51-50-0506, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 70.92, 19.27, and 34.05 RCW. 07-01-091, § 51-50-0506, filed 12/19/06, effective 7/1/07.]

WAC 51-50-0509 Reserved.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 10-03-097, § 51-50-0509, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 70.92, 19.27, and 34.05 RCW. 07-01-091, § 51-50-0509, filed 12/19/06, effective 7/1/07.]

WAC 51-50-0708 Section 708—Shaft enclosures.

708.14.2.12 Hoistway venting. Hoistway venting required by Section 3004 need not be provided for pressurized elevator shafts.

708.14.2.13 Machine rooms. Elevator machine rooms shall be pressurized in accordance with this section unless separated from the hoistway shaft by construction in accordance with Section 707.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 10-03-097, amended and recodified as § 51-50-0708, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 70.92, 19.27, and 34.05 RCW. 07-01-091, § 51-50-0707, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-108, § 51-50-0707, filed 12/17/03, effective 7/1/04.]

WAC 51-50-0710 Section 710—Smoke barriers.

710.4 Continuity. Smoke barriers shall form an effective membrane continuous from outside wall to outside wall and from the top of the foundation or floor/ceiling assembly below to the underside of the floor or roof sheathing, deck or slab above, including continuity through concealed spaces, such as those found above suspended ceiling, and interstitial structural and mechanical spaces. The supporting construction shall be protected to afford the required fire-resistance rating of the wall or floor supported in buildings of other than Type IIB, IIIB, or VB construction.

EXCEPTIONS:
1. Smoke-barrier walls are not required in interstitial spaces where such spaces are designed and constructed with ceilings that provide resistance to the passage of fire and smoke equivalent to that provided by the smoke-barrier walls.
2. Smoke barriers provided to enclose areas of refuge as required by Section 1007.6 are not required to extend from outside wall to outside wall.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 10-03-097, § 51-50-0710, filed 1/20/10, effective 7/1/10.]

WAC 51-50-0903 Section 903—Automatic sprinkler systems.

903.2.1.6 Nightclub. An automatic sprinkler system shall be provided throughout Group A-2 nightclubs as defined in this code.

903.2.3 Group E. An automatic sprinkler system shall be provided for Group E Occupancies.

EXCEPTIONS:
1. Portable school classrooms, provided aggregate area of any cluster or portion of a cluster of portable school classrooms does not exceed 5,000 square feet (1465 m^2); and clusters of portable school classrooms shall be separated as required by the building code.
2. Group E occupancies with an occupant load of 50 or less, calculated in accordance with Table 1004.1.1.

903.2.7 Group M. An automatic sprinkler system shall be provided throughout buildings containing a Group M occupancy, where one of the following conditions exists:

1. A Group M fire area exceeds 12,000 square feet (1115 m^2).

2. A Group M fire area is located more than three stories above grade plane.

3. The combined area of all Group M fire areas on all floors, including any mezzanines, exceeds 24,000 square feet (2230 m^2).

4. Where a Group M occupancy that is used for the display and sale of upholstered furniture or mattresses exceeds 5000 square feet (464 m^2).

903.2.8 Group R. An automatic fire sprinkler system installed in accordance with Section 903.3 shall be provided throughout all buildings with a Group R fire area.

EXCEPTION: Group R-1 if all of the following conditions apply:
1. The Group R fire area is no more than 500 square feet and is used for recreational use only.
2. The Group R fire area is only one story.
3. The Group R fire area does not include a basement.
4. The Group R fire area is no closer than 30 feet from another structure.
5. Cooking is not allowed within the Group R fire area.
6. The Group R fire area has an occupant load of no more than 8.
7. A hand held (portable) fire extinguisher is in every Group R fire area.

[Statutory Authority: Chapter 19.27 RCW. 10-24-059, § 51-50-0903, filed 11/29/10, effective 7/1/11. Statutory Authority: RCW 19.27.031 and 19.27.074. 10-03-097, § 51-50-0903, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.190, 19.27.020, and chapters 19.27 and 34.05 RCW. 08-01-110, § 51-50-0903, filed 12/18/07, effective 4/1/08. Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 70.92, 19.27, and 34.05 RCW. 07-01-091, § 51-50-0903, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.020, 19.27.031, 19.27.074, and chapters 19.27 and 34.05 RCW. 05-24-070, § 51-50-0903, filed 12/5/05, effective 7/1/06. Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-108, § 51-50-0903, filed 12/17/03, effective 7/1/04.]

WAC 51-50-0907 Section 907—Fire alarm and detection systems.

[F] 907.2.8 Group R-1. Fire alarm systems, smoke alarms and carbon monoxide alarms shall be installed in Group R-1 occupancies as required in Sections 907.2.8.1 through 907.2.8.4.

[F] 907.2.8.4. Carbon monoxide alarms. For new construction, an approved carbon monoxide alarm shall be installed by January 1, 2011, outside of each separate sleeping area in the immediate vicinity of the bedroom in sleeping units. In a building where a tenancy exists, the tenant shall maintain the CO alarm as specified by the manufacturer including replacement of the batteries.

[F] 907.2.8.4.1 Existing sleeping units. Existing sleeping units shall be equipped with carbon monoxide alarms by July 1, 2011.

[F] 907.2.8.4.2 Alarm requirements. Single station carbon monoxide alarms shall be listed as complying with UL 2034 and shall be installed in accordance with this code and the manufacturer's installation instructions.

[F] 907.2.9 Group R-2. Fire alarm systems, smoke alarms and carbon monoxide alarms shall be installed in Group R-2 occupancies as required in Sections 907.2.9.1 through 907.2.9.3.

[F] 907.2.9.3. Carbon monoxide alarms. For new construction, an approved carbon monoxide alarm shall be installed by January 1, 2011, outside of each separate sleeping area in the immediate vicinity of the bedroom in dwelling units. In a building where a tenancy exists, the tenant shall maintain the CO alarm as specified by the manufacturer including replacement of the batteries.

[F] 907.2.9.3.1 Existing dwelling units. Existing dwelling units shall be equipped with carbon monoxide alarms by July 1, 2011.

907.2.9.3.2 Alarm requirements. Single station carbon monoxide alarms shall be listed as complying with UL 2034 and shall be installed in accordance with this code and the manufacturer's installation instructions.

[F]907.2.10 Group R-3. Carbon monoxide alarms shall be installed in Group R-3 occupancies as required in Sections 907.2.10.1 through 907.2.10.3.

[F]907.2.l0.1 Carbon monoxide alarms. For new construction, an approved carbon monoxide alarm shall be installed by January 1, 2011, outside of each separate sleeping area in the immediate vicinity of the bedroom in dwelling units. In a building where a tenancy exists, the tenant shall maintain the CO alarm as specified by the manufacturer including replacement of the batteries.

[F]907.2.10.2 Existing dwelling units. Existing dwelling units shall be equipped with carbon monoxide alarms by July 1, 2011.

EXCEPTION: Owner-occupied Group R-3 residences legally occupied prior to July 1, 2010.

[F]907.2.10.3 Alarm requirements. Single station carbon monoxide alarms shall be listed as complying with UL 2034 and shall be installed in accordance with this code and the manufacturer's installation instructions.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 10-03-097, § 51-50-0907, filed 1/20/10, effective 7/1/10.]

Reviser's note: The brackets and enclosed material in the text of the above section occurred in the copy filed by the agency.

WAC 51-50-0909 Section 909—Smoke control systems.

909.6.3 Elevator shaft pressurization. Where elevator shaft pressurization is required to comply with Exception 6 of Section 708.14.1, the pressurization system shall comply with and be maintained in accordance with 708.14.2.

909.6.3.1 Activation. The elevator shaft pressurization system shall be activated by a fire alarm system which shall include smoke detectors or other approved detectors located near the elevator shaft on each floor as approved by the building official and fire code official. If the building has a fire alarm panel, detectors shall be connected to, with power supplied by, the fire alarm panel.

909.6.3.2 Power system. The power source for the fire alarm system and the elevator shaft pressurization system shall be in accordance with Section 909.11.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 10-03-097, § 51-50-0909, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 70.92, 19.27, and 34.05 RCW. 07-01-091, § 51-50-0909, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.020, 19.27.031, 19.27.074, and chapters 19.27 and 34.05 RCW. 05-24-070, § 51-50-0909, filed 12/5/05, effective 7/1/06. Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-108, § 51-50-0909, filed 12/17/03, effective 7/1/04.]

WAC 51-50-0911 Section 911—Fire command center.

911.1.2 Separation. The fire command center shall be separated from the remainder of the building by not less than a 2-hour fire barrier constructed in accordance with Section 707 or horizontal assembly constructed in accordance with Section 712, or both.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 10-03-097, § 51-50-0911, filed 1/20/10, effective 7/1/10.]

WAC 51-50-1005 Section 1005—Egress width.

1005.1 Minimum required egress width. The means of egress width shall not be less than required by this section. The total width of means of egress in inches (mm) shall not be less than the total occupant load served by the means of egress multiplied by 0.3 inches (7.62 mm) per occupant for stairways and by 0.2 inches (5.08 mm) per occupant for other egress components. The width shall not be less than specified elsewhere in this code. Multiple means of egress shall be sized such that the loss of any one means of egress shall not reduce the available capacity to less than 50 percent of the required capacity. The maximum capacity required from any story of a building shall be maintained to the termination of the means of egress.

EXCEPTIONS:
1. Means of egress complying with Section 1028.
2. For other than H and I-2 occupancies, the total width of means of egress in inches (mm) shall not be less than the total occupant load served by the means of egress multiplied by 0.2 inches (5.1 mm) per occupant for stairways and by 0.15 inches (3.8 mm) per occupant for other egress components in buildings that are provided with sprinkler protection in accordance with 903.3.1.1 or 903.3.1.2 and an emergency voice/alarm communication system in accordance with 907.5.2.2.

[Statutory Authority: Chapter 19.27 RCW. 10-24-059, § 51-50-1005, filed 11/29/10, effective 7/1/11.]

WAC 51-50-1007 Section 1007—Accessible means of egress.

1007.1 Accessible means of egress required. Accessible means of egress shall comply with this section. Accessible spaces shall be provided with not less than one accessible means of egress. Where more than one means of egress are required by Section 1015.1 or 1021.1 from any accessible space, each accessible portion of the space shall be served by not less than two accessible means of egress.

EXCEPTIONS:
1. Accessible means of egress are not required in alterations to existing buildings.
2. One accessible means of egress is required from an accessible mezzanine level in accordance with Section 1007.3, 1007.4 or 1007.5.
3. In assembly areas with sloped or stepped aisles, one accessible means of egress is permitted where the common path of travel is accessible and meets the requirements in Section 1028.8.
4. In parking garages, accessible means of egress are not required to serve parking areas that do not contain accessible parking spaces.

1007.8 Two-way communication. A two-way communication system shall be provided at the elevator landing on each accessible floor that is one or more stories above or below the story of exit discharge complying with Sections 1007.8.1 and 1007.8.2.

EXCEPTIONS:
1. Two-way communication systems are not required at the elevator landing where two-way communication is provided within the areas of refuge in accordance with section 1007.6.3.
2. Two-way communication systems are not required on floors provided with exit ramps conforming to provisions of section 1010.

1007.8.1 System requirements. Two-way communication systems shall provide communication between each required location and the fire command center or a central control point location approved by the fire department. Where the central control point is not constantly attended, a two-way

communication system shall have a timed automatic telephone dial-out capability to a monitoring location. The two-way communication system shall include both audible and visible signals. The two-way communication system shall have a battery backup or an approved alternate source of power that is capable of 90 minutes use upon failure of the normal power source.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 10-03-097, § 51-50-1007, filed 1/20/10, effective 7/1/10.]

WAC 51-50-1008 Section 1008—Doors, gates and turnstiles.

1008.1.9.3 Locks and latches. Locks and latches shall be permitted to prevent operation of doors where any of the following exists:

1. Places of detention or restraint.

2. In buildings in occupancy Group A having an occupant load of 300 or less, Groups B, F, M and S, and in places of religious worship, the main exterior door or doors are permitted to be equipped with key-operated locking devices from the egress side provided:

2.1 The locking device is readily distinguishable as locked;

2.2 A readily visible sign is posted on the egress side on or adjacent to the door stating: THIS DOOR TO REMAIN UNLOCKED WHEN BUILDING IS OCCUPIED. The sign shall be in letters 1 inch (25 mm) high on a contrasting background; and

2.3 The use of the key-operated locking device is revocable by the building official for due cause.

3. Where egress doors are used in pairs, approved automatic flush bolts shall be permitted to be used, provided that the door leaf having the automatic flush bolts has no doorknob or surface-mounted hardware.

4. Doors from individual dwelling or sleeping units of Group R occupancies having an occupant load of 10 or less are permitted to be equipped with a night latch, dead bolt, or security chain, provided such devices are openable from the inside without the use of a key or a tool.

5. Fire doors after the minimum elevated temperature has disabled the unlatching mechanism in accordance with listed fire door test procedures.

6. Approved, listed locks without delayed egress shall be permitted in Group R-2 boarding homes licensed by Washington state, provided that:

6.1. The clinical needs of one or more patients require specialized security measures for their safety.

6.2. The doors unlock upon actuation of the automatic sprinkler system or automatic fire detection system.

6.3. The doors unlock upon loss of electrical power controlling the lock or lock mechanism.

6.4. The lock shall be capable of being deactivated by a signal from a switch located in an approved location.

6.5. There is a system, such as a keypad and code, in place that allows visitors, staff persons and appropriate residents to exit. Instructions for exiting shall be posted within six feet of the door.

1008.1.9.6 Special locking arrangements in Group I-2. Approved locks shall be permitted in a Group I-2 Occupancy where the clinical needs of persons receiving care require such locking. Locks shall be permitted in such occupancies where the building is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or an approved automatic smoke or heat detection system installed in accordance with Section 907, provided that the doors unlock in accordance with Items 1 through 6 below.

1. The doors unlock upon actuation of the automatic sprinkler system or automatic fire detection system.

2. The doors unlock upon loss of power controlling the lock or lock mechanism.

3. The door locks shall have the capability of being unlocked by a signal from the fire command center, a nursing station or other approved location.

4. The procedures for the operation(s) of the unlocking system shall be described and approved as part of the emergency planning and preparedness required by Chapter 4 of the International Fire Code.

5. There is a system, such as a keypad and code, in place that allows visitors, staff persons and appropriate residents to exit. Instructions for exiting shall be posted within six feet of the door.

6. Emergency lighting shall be provided at the door.

EXCEPTION: Items 1, 2, 3, and 5 shall not apply to doors to areas where persons which because of clinical needs require restraint or containment as part of the function of a Group I-2 mental hospital provided that all clinical staff shall have the keys, codes or other means necessary to operate the locking devices.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 10-03-097, § 51-50-1008, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 70.92, 19.27, and 34.05 RCW. 07-01-091, § 51-50-1008, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.020, 19.27.031, 19.27.074, and chapters 19.27 and 34.05 RCW. 05-24-070, § 51-50-1008, filed 12/5/05, effective 7/1/06. Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-108, § 51-50-1008, filed 12/17/03, effective 7/1/04.]

WAC 51-50-1009 Section 1009—Stairways and handrails.

1009.15 Stairways in individual dwelling units. Stairs or ladders within an individual dwelling unit used for access to areas of 200 square feet (18.6 m^2) or less, and not containing the primary bathroom or kitchen, are exempt from the requirements of Section 1009.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 10-03-097, § 51-50-1009, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 70.92, 19.27, and 34.05 RCW. 07-01-091, § 51-50-1009, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-108, § 51-50-1009, filed 12/17/03, effective 7/1/04.]

WAC 51-50-10100 Section 1010—Ramps.

1010.1 Scope. The provisions of this section shall apply to ramps used as a component of a means of egress.

EXCEPTIONS:
1. Other than ramps that are part of the accessible routes providing access in accordance with Sections 1108.2 through 1108.2.4 and 1108.2.6, ramped aisles within assembly rooms or spaces shall conform with the provisions in Section 1028.11.
2. Curb ramps shall comply with ICC A117.1.
3. Vehicle ramps in parking garages for pedestrian exit access shall not be required to comply with Sections 1010.3 through 1010.9 when they are not an accessible route serving accessible parking spaces or other required accessible elements.
4. In a parking garage where one accessible means of egress serving accessible parking spaces or other

accessible elements is provided, a second accessible means of egress serving that area may include a vehicle ramp that does not comply with Sections 1010.4, 1010.5, and 1010.8. A landing complying with Sections 1010.6.1 and 1010.6.4 shall be provided at any change of direction in the accessible means of egress.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 10-03-097, § 51-50-10100, filed 1/20/10, effective 7/1/10.]

WAC 51-50-1014 Exit access.

1014.2.2 Group I-2.

General. Habitable spaces and suites in Group I-2 occupancies are permitted to comply with this Section 1014.2.2.

1014.2.2.1 Exit access doors. Habitable spaces and suites in Group I-2 occupancies shall have an exit access door leading directly to a corridor.

EXCEPTION: Rooms with exit doors opening directly to the outside at ground level.

1014.2.2.2 Exit access through suites. Exit access from areas not classified as a Group I-2 Occupancy suite shall not pass through a suite. In a suite required to have more than one exit, one exit access may pass through an adjacent suite if all other requirements of Section 1014.2 are satisfied.

1014.2.2.3 Separation. Suites in Group I-2 Occupancies shall be separated from other portions of the building by a smoke partition complying with Section 711. Partitions within suites are not required to be smoke-resistant or fire-resistance-rated unless required by another section of this Code.

1014.2.2.4 Suites containing patient sleeping areas. Patient sleeping areas in Group I-2 Occupancies shall be permitted to be divided into suites with one intervening room if one of the following conditions is met:

1. The intervening room within the suite is not used as an exit access for more than eight patient beds.

2. The arrangement of the suite allows for direct and constant visual supervision by nursing personnel.

1014.2.2.4.1 Area. Suites of sleeping rooms shall not exceed 5,000 square feet (465 m^2).

1014.2.2.4.2 Exit access. Any patient sleeping room, or any suite that includes patient sleeping rooms, of more than 1,000 square feet (93 m^2) shall have at least two exit access doors located in accordance with Section 1015.2.

1014.2.2.4.3 Travel distance. The travel distance between any point in a suite of sleeping rooms and an exit access door of that suite shall not exceed 100 feet (30,480 mm). The travel distance between any point in a Group I-2 Occupancy patient sleeping room and an exit access door in that room shall not exceed 50 feet (15,240 mm).

1014.2.2.5 Suites not containing patient sleeping areas. Areas other than patient sleeping areas in Group I-2 Occupancies shall be permitted to be divided into suites that comply with Sections 1014.2.2.5.1 through 1014.2.2.5.4.

1014.2.2.5.1 Area. Suites of rooms, other than patient sleeping rooms, shall not exceed 10,000 square feet (929 m^2).

1014.2.2.5.2 Exit access. Any rooms or suite of rooms, other than patient sleeping rooms, of more than 2,500 square feet (232 m^2) shall have at least two exit access doors located in accordance with Section 1015.2.

1014.2.2.5.3 One intervening room. For rooms other than patient sleeping rooms, suites of rooms are permitted to have one intervening room if the travel distance within the suite to the exit access door is not greater than 100 feet (30,480 mm).

1014.2.2.5.4 Two intervening rooms. For rooms other than patient sleeping rooms located within a suite, exit access travel from within the suite shall be permitted through two intervening rooms where the travel distance to the exit access door is not greater than 50 feet (15,240 mm).

[Statutory Authority: RCW 19.27.031 and 19.27.074. 10-03-097, § 51-50-1014, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 70.92, 19.27, and 34.05 RCW. 07-01-091, § 51-50-1014, filed 12/19/06, effective 7/1/07.]

WAC 51-50-1015 Reserved.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 10-03-097, § 51-50-1015, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 70.92, 19.27, and 34.05 RCW. 07-01-091, § 51-50-1015, filed 12/19/06, effective 7/1/07.]

WAC 51-50-1018 Section 1018—Corridors.

1018.5 Air movement in corridors. Corridors shall not serve as supply, return, exhaust, relief or ventilation air ducts.

EXCEPTIONS:
1. Use of a corridor as a source of makeup air for exhaust systems in rooms that open directly onto such corridors, including toilet rooms, bathrooms, dressing rooms, smoking lounges and janitor closets, shall be permitted provided that each such corridor is directly supplied with outdoor air at a rate greater than the rate of makeup air taken from the corridor.
2. Where located within a dwelling unit, the use of corridors for conveying return air shall not be prohibited.
3. Where located within tenant spaces of one thousand square feet (93 m^2) or less in area, utilization of corridors for conveying return air is permitted.
4. Incidental air movement from pressurized rooms within health care facilities, provided that a corridor is not the primary source of supply or return to the room.
5. Where such air is part of an engineered smoke control system.
6. Air supplied to corridors serving residential occupancies shall not be considered as providing ventilation air to the dwelling units subject to the following:
6.1 The air supplied to the corridor is one hundred percent outside air; and
6.2 The units served by the corridor have conforming ventilation air independent of the air supplied to the corridor; and
6.3 For other than high-rise buildings, the supply fan will automatically shut off upon activation of corridor smoke detectors which shall be spaced at no more than thirty feet (9,144 mm) on center along the corridor; or
6.4 For high-rise buildings, corridor smoke detector activation will close required smoke/fire dampers at the supply inlet to the corridor at the floor receiving the alarm.

1018.6 Corridor continuity. Fire-resistance-rated corridors shall be continuous from the point of entry to an exit, and shall not be interrupted by intervening rooms.

EXCEPTIONS:
1. Foyers, lobbies or reception rooms constructed as required for corridors shall not be construed as intervening rooms.
2. In Group R-2 boarding homes and residential treatment facilities licensed by Washington state, seating

areas shall be allowed to be open to the corridor provided:
2.1 The seating area is constructed as required for the corridor;
2.2 The floor is separated into at least two compartments complying with Section 407.4;
2.3 Each individual seating area does not exceed 150 square feet, excluding the corridor width;
2.4 The combined total space of seating areas per compartment does not exceed 300 square feet, excluding the corridor width;
2.5 Combustible furnishings located within the seating area shall be in accordance with the International Fire Code Section 805; and
2.6 Emergency means of egress lighting is provided as required by Section 1006 to illuminate the area.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 10-03-097, amended and recodified as § 51-50-1018, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 70.92, 19.27, and 34.05 RCW. 07-01-091, § 51-50-1017, filed 12/19/06, effective 7/1/07.]

WAC 51-50-1019 Reserved.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 10-03-097, § 51-50-1019, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 70.92, 19.27, and 34.05 RCW. 07-01-091, § 51-50-1019, filed 12/19/06, effective 7/1/07.]

WAC 51-50-1106 Section 1106—Parking and passenger loading facilities.

1106.3 Group I-2 outpatient facilities. Ten percent, but not less than one, of patient and visitor parking spaces provided to serve Group I-2 outpatient facilities shall be accessible.

1106.6 Location. Accessible parking spaces shall be located on the shortest accessible route of travel from adjacent parking to an accessible building entrance. In parking facilities that do not serve a particular building, accessible parking spaces shall be located on the shortest route to an accessible pedestrian entrance to the parking facility. Where buildings have multiple accessible entrances with adjacent parking, accessible parking spaces shall be dispersed and located near the accessible entrances. Wherever practical, the accessible route shall not cross lanes of vehicular traffic. Where crossing traffic lanes is necessary, the route shall be designated and marked as a crosswalk.

EXCEPTION:
1. In multilevel parking structures, van accessible parking spaces are permitted on one level.
2. Accessible parking spaces shall be permitted to be located in different parking facilities if substantially equivalent or greater accessibility is provided in terms of distance from an accessible entrance or entrances, parking fee and user convenience.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 10-03-097, § 51-50-1106, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 70.92, 19.27, and 34.05 RCW. 07-01-091, § 51-50-1106, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-108, § 51-50-1106, filed 12/17/03, effective 7/1/04.]

WAC 51-50-1203 Section 1203—Ventilation.

1203.1 General. Buildings shall be provided with natural ventilation in accordance with Section 1203.4, or mechanical ventilation in accordance with the *International Mechanical Code*.

1203.2 Attic spaces. Enclosed attics and enclosed rafter spaces formed where ceilings are applied directly to the underside of roof framing members shall have cross ventilation for each separate space by ventilating openings protected against the entrance of rain and snow. Blocking and bridging shall be arranged so as not to interfere with the movement of air. A minimum of 1 inch (25 mm) of airspace shall be provided between the insulation and the roof sheathing. The net free ventilating area shall not be less than 1/150th of the area of the space ventilated, with 50 percent of the required ventilating area provided by ventilators located in the upper portion of the space to be ventilated at least 3 feet (914 mm) above eave or cornice vents with the balance of the required ventilation provided by eave or cornice vents.

EXCEPTIONS:
1. The minimum required net free ventilating shall be 1/300 of the area of the space ventilated, provided a vapor retarder having a transmission rate not exceeding one perm in accordance with ASTM E 96 is installed on the warm side of the attic insulation and provided 50 percent of the required ventilating area provided by ventilators located in the upper portion of the space to be ventilated is at least 3 feet (914 mm) above eave or cornice vents, with the balance of the required ventilation provided by eave or cornice vents.
2. Unvented attic assemblies (spaces between the ceiling joists of the top story and the roof rafters) shall be permitted if all the following conditions are met:
2.1 The unvented attic space is completely contained within the building thermal envelope.
2.2 No interior vapor retarders are installed on the ceiling side (attic floor) of the unvented attic assembly.
2.3 Where wood shingles or shakes are used, a minimum 1/4 inch (6 mm) vented air space separates the shingles or shakes and the roofing underlayment above the structural sheathing.
2.4 Any air-impermeable insulation shall be a vapor retarder, or shall have a vapor retarder coating or covering in direct contact with the underside of the insulation.
2.5 Either items a, b, or c below shall be met, depending on the air permeability of the insulation directly under the structural roof sheathing.
a. Air-impermeable insulation only. Insulation shall be applied in direct contact to the underside of the structural roof sheathing.
b. Air-permeable insulation only. In addition to the air-permeable insulation installed directly below the structural sheathing, rigid board or sheet insulation shall be installed directly above the structural roof sheathing as specified per WA Climate Zone for condensation control.
i. Climate Zone #1 - R-10 minimum rigid board or air-impermeable insulation R-value.
ii. Climate Zone #2 - R-25 minimum rigid board or air-impermeable insulation R-value.
c. Air-impermeable and air-permeable insulation. The air-impermeable insulation shall be applied in direct contact to the underside of the structural roof sheathing as specified per WA Climate Zone for condensation control. The air-permeable insulation shall be installed directly under the air-impermeable insulation.
i. Climate Zone #1 - R-10 minimum rigid board or air-impermeable insulation R-value.
ii. Climate Zone #2 - R-25 minimum rigid board or air-impermeable insulation R-value.

1203.4 Natural ventilation. For other than Group R Occupancies, natural ventilation of an occupied space shall be through windows, doors, louvers or other openings to the outdoors. The operating mechanism for such openings shall be provided with ready access so that the openings are readily controllable by the building occupants. Group R Occupancies shall comply with the *International Mechanical Code*.

1203.6 Radon resistive construction standards. The criteria of this section establishes minimum radon resistive construction requirements for Group R Occupancies.

1203.6.1 Application. The requirements of Section 1203.6 shall be adopted and enforced by all jurisdictions of the state according to the following subsections.

1203.6.1.1 All jurisdictions of the state shall comply with Section 1203.6.2.

1203.6.1.2 Clark, Ferry, Okanogan, Pend Oreille, Skamania, Spokane, and Stevens counties shall also comply with Section 1203.6.3.

1203.6.2 State wide radon requirements.

1203.6.2.1 Crawlspaces. All crawlspaces shall comply with the requirements of this section.

1203.6.2.2 Ventilation. All crawlspaces shall be ventilated as specified in Section 1203.3.

If the installed ventilation in a crawlspace is less than one square foot for each 300 square feet of crawlspace area, or if the crawlspace vents are equipped with operable louvers, a radon vent shall be installed to originate from a point between the ground cover and soil. The radon vent shall be installed in accordance with Sections 1203.6.3.2.6 and 1203.6.3.2.7.

1203.6.2.3 Crawlspace plenum systems. In crawlspace plenum systems used for providing supply air for an HVAC system, aggregate, a permanently sealed soil gas retarder membrane and a radon vent pipe shall be installed in accordance with Section 1203.6.3.2. Crawlspaces shall not be used for return air plenums.

In addition, an operable radon vent fan shall be installed and activated. The fan shall be located as specified in Section 1203.6.3.2.7. The fan shall be capable of providing at least 100 cfm at 1-inch water column static pressure. The fan shall be controlled by a readily accessible manual switch. The switch shall be labeled "RADON VENT FAN."

1203.6.3 Radon prescriptive requirements.

1203.6.3.1 Scope. This section applies to those counties specified in Section 1203.6.1.2. This section establishes prescriptive construction requirements for reducing the potential for radon entry into all Group R Occupancies, and for preparing the building for future mitigation if desired.

In all crawlspaces, except crawlspace plenums used for providing supply air for an HVAC system, a continuous air barrier shall be installed between the crawlspace area and the occupied area to limit air transport between the areas. If a wood sheet subfloor or other material is utilized as an air barrier, in addition to the requirements of Section 502.1.6.2 of the Washington State Energy Code, all joints between sheets shall be sealed.

1203.6.3.2 Floors in contact with the earth.

1203.6.3.2.1 General. Concrete slabs that are in direct contact with the building envelope shall comply with the requirements of this section.

EXCEPTION: Concrete slabs located under garages or other than Group R Occupancies need not comply with this chapter.

1203.6.3.2.2 Aggregate. A layer of aggregate of 4-inch minimum thickness shall be placed beneath concrete slabs. The aggregate shall be continuous to the extent practical.

1203.6.3.2.3 Gradation. Aggregate shall:

1. Comply with ASTM Standard C-33 Standard Specification for Concrete Aggregate and shall be size No. 8 or larger size aggregate as listed in Table 2, Grading Requirements for Course Aggregate; or

2. Meet the 1988 Washington State Department of Transportation Specification 9-03.1 (3) "Coarse Aggregate for Portland Cement Concrete," or any equivalent successor standards. Aggregate size shall be of Grade 8 or larger as listed in Section 9-03.1 (3) C, "Grading"; or

3. Be screened, washed pea gravel free of deleterious substances in a manner consistent with ASTM Standard C-33 with 100 percent passing a 1/2-inch sieve and less than 5 percent passing a No. 16 sieve. Sieve characteristics shall conform to those acceptable under ASTM Standard C-33.

EXCEPTION: Aggregate shall not be required if a substitute material or system, with sufficient load bearing characteristics, and having approved capability to provide equal or superior air flow, is installed.

1203.6.3.2.4 Soil-gas retarder membrane. A soil-gas retarder membrane, consisting of at least one layer of virgin polyethylene with a thickness of at least 6 mil, or equivalent flexible sheet material, shall be either placed directly under all concrete slabs so that the slab is in direct contact with the membrane, or on top of the aggregate with 2 inches minimum of fine sand or pea gravel installed between the concrete slab and membrane. The flexible sheet shall extend to the foundation wall or to the outside edge of the monolithic slab. Seams shall overlap at least 12 inches. The membrane shall also be fitted tightly to all pipes, wires, and other penetrations of the membrane and sealed with an approved sealant or tape. All punctures or tears shall be repaired with the same or approved material and similarly lapped and sealed.

1203.6.3.2.5 Sealing of penetrations and joints. All penetrations and joints in concrete slabs or other floor systems and walls below grade shall be sealed by an approved sealant to create an air barrier to limit the movement of soil-gas into the indoor air.

Sealants shall be approved by the manufacturer for the intended purpose. Sealant joints shall conform to manufacturer's specifications. The sealant shall be placed and tooled in accordance with manufacturer's specifications. There shall be no gaps or voids after the sealant has cured.

1203.6.3.2.6 Radon vent. One continuous sealed pipe shall run from a point within the aggregate under each concrete slab to a point outside the building. Joints and connections shall be permanently gas tight. The continuous sealed pipe shall interface with the aggregate in the following manner, or by other approved equal method. The pipe shall be permanently connected to a "T" within the aggregate area so that the two end openings of the "T" lie within the aggregate area. A minimum of 5 feet of perforated drain pipe of 3 inches minimum diameter shall join to and extend from the "T." The perforated pipe shall remain in the aggregate area and shall not be capped at the ends. The "T" and its perforated pipe exten-

sions shall be located at least 5 feet horizontally from the exterior perimeter of the aggregate area.

The continuous sealed pipe shall terminate no less than 12 inches above the eave, and more than 10 horizontal feet from a woodstove or fireplace chimney, or operable window. The continuous sealed pipe shall be labeled "radon vent." The label shall be placed so as to remain visible to an occupant.

The minimum pipe diameter shall be 3 inches unless otherwise approved. Acceptable sealed plastic pipe shall be smooth walled, and may include either PVC schedule 40 or ABS schedule of equivalent wall thickness.

The entire sealed pipe system shall be sloped to drain to the subslab aggregate.

The sealed pipe system may pass through an unconditioned attic before exiting the building; but to the extent practicable, the sealed pipe shall be located inside the thermal envelope of the building in order to enhance passive stack venting.

EXCEPTION: A fan for subslab depressurization system includes the following:
1. Soil-gas retarder membrane as specified in Section 1203.6.3.2.4;
2. Sealing of penetrations and joints as specified in Section 1203.6.3.2.5;
3. A 3-inch continuous sealed radon pipe shall run from a point within the aggregate under each concrete slab to a point outside the building;
4. Joints and connections shall be gas tight, and may be of either PVC schedule 40 or ABS schedule of equivalent in wall thickness;
5. A label of "radon vent" shall be placed on the pipe so as to remain visible to an occupant;
6. Fan circuit and wiring as specified in Section 1203.6.3.2.7 and a fan.

If the subslab depressurization system is exhausted through the concrete foundation wall or rim joist, the exhaust terminus shall be a minimum of 6 feet from operable windows or outdoor air intake vents and shall be directed away from operable windows and outdoor air intake vents to prevent radon reentrainment.

1203.6.3.2.7 Fan circuit and wiring and location. An area for location of an in-line fan shall be provided. The location shall be as close as practicable to the radon vent pipe's point of exit from the building, or shall be outside the building shell; and shall be located so that the fan and all downstream piping is isolated from the indoor air.

Provisions shall be made to allow future activation of an in-line fan on the radon vent pipe without the need to place new wiring. A 110 volt power supply shall be provided at a junction box near the fan location.

1203.6.3.2.8 Separate aggregate areas. If the 4-inch aggregate area underneath the concrete slab is not continuous, but is separated into distinct isolated aggregate areas by a footing or other barrier, a minimum of one radon vent pipe shall be installed into each separate aggregate area.

EXCEPTION: Separate aggregate areas may be considered a single area if a minimum 3-inch diameter connection joining the separate areas is provided for every 30 feet of barrier separating those areas.

1203.6.3.2.9 Concrete block walls. Concrete block walls connected to below grade areas shall be considered unsealed surfaces. All openings in concrete block walls that will not remain accessible upon completion of the building shall be sealed at both vertical and horizontal surfaces, in order to create a continuous air barrier to limit the transport of soil-gas into the indoor air.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 10-03-097, § 51-50-1203, filed 1/20/10, effective 7/1/10; 04-01-108, § 51-50-1203, filed 12/17/03, effective 7/1/04.]

WAC 51-50-1208 Section 1208—Interior space dimensions.

1208.2 Minimum ceiling heights. Occupiable spaces and habitable spaces shall have a ceiling height of not less than 7 feet 6 inches (2286 mm). Bathrooms, toilet rooms, kitchen, storage rooms and laundry rooms shall be permitted to have a ceiling height of not less than 7 feet (2134 mm).

EXCEPTIONS: 1. In one- and two-family dwellings, beams or girders spaced not less than 4 feet (1219 mm) on center and projecting not more than 6 inches (152 mm) below the required ceiling height.
2. If any room in a building has a sloped ceiling, the prescribed ceiling height for the room is required in one-half the area thereof. Any portion of the room measuring less than 5 feet (1524 mm) from the finished floor to the ceiling shall not be included in any computation of the minimum area thereof.
3. Mezzanines constructed in accordance with Section 505.1.

1208.3 Room area. Every dwelling unit shall have at least one room that shall have not less than 120 square feet (13.9 m^2) of net floor area. Other habitable rooms shall have a net floor area of not less than 70 square feet (6.5 m^2).

EXCEPTION: Kitchens in one- and two-family dwellings.

Portions of a room with a sloped ceiling measuring less than 5 feet (1524 mm) or a flat ceiling measuring less than 7 feet (2134 mm) from the finished floor to the finished ceiling shall not be considered as contributing to the minimum habitable area for that room.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 10-03-097, § 51-50-1208, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.020, 19.27.031, 19.27.074 and chapters 19.27 and 34.05 RCW. 05-01-014, § 51-50-1208, filed 12/2/04, effective 7/1/05. Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-108, § 51-50-1208, filed 12/17/03, effective 7/1/04.]

WAC 51-50-1403 Section 1403—Performance requirements.

1403.2 Weather protection. Exterior walls shall provide the building with a weather-resistant exterior wall envelope. The exterior wall envelope shall include flashing as described in Section 1405.4. The exterior wall envelope shall be designed and constructed in such a manner as to prevent the accumulation of water within the wall assembly by providing a water-resistant barrier behind the exterior veneer, as described in Section 1404.2, and a means of draining water that enters the assembly to the exterior. An air space cavity is not required under the exterior cladding for an exterior wall clad with lapped or panel siding made of plywood, engineered wood, hardboard, or fiber cement. Protection against condensation in the exterior wall assembly shall be provided in accordance with Section 1405.3.

EXCEPTIONS: 1. A weather-resistant exterior wall envelope shall not be required over concrete or masonry walls designed in accordance with Chapters 19 and 21, respectively.

2. Compliance with the requirements for a means of drainage, and the requirements of Sections 1404.2 and 1405.3, shall not be required for an exterior wall envelope that has been demonstrated through testing to resist wind-driven rain, including joints, penetrations and intersections with dissimilar materials, in accordance with ASTM E 331 under the following conditions:

2.1 Exterior wall envelope test assemblies shall include at least one opening, one control joint, one wall/eave interface and one wall sill. All tested openings and penetrations shall be representative of the intended end-use configuration.

2.2 Exterior wall envelope test assemblies shall be at least 4 feet by 8 feet (1219 mm by 2438 mm) in size.

2.3 Exterior wall envelope assemblies shall be tested at a minimum differential pressure of 6.24 pounds per square foot (psf) (0.297 kN/m^2).

2.4 Exterior wall envelope assemblies shall be subjected to a minimum test exposure duration of 2 hours. The exterior wall envelope design shall be considered to resist wind-driven rain where the results of testing indicate that water did not penetrate control joints in the exterior wall envelope, joints at the perimeter of openings or intersections of terminations with dissimilar materials.

3. Exterior insulation and finish systems (EIFS) complying with Section 1408.4.1.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 10-03-097, § 51-50-1403, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.190, 19.27.020, and chapters 19.27 and 34.05 RCW. 08-01-110, § 51-50-1403, filed 12/18/07, effective 4/1/08.]

WAC 51-50-1405 Section 1405—Installation of wall coverings.

1405.6.2 Seismic requirements. Anchored masonry veneer located in Seismic Design Category C, D, E, or F shall conform to the requirements of Section 6.2.2.10, except Section 6.2.2.10.3.2, of TMS 402/ACI 530/ASCE 5.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 10-03-097, § 51-50-1405, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 70.92, 19.27, and 34.05 RCW. 07-01-091, § 51-50-1405, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.020, 19.27.031, 19.27.074 and chapters 19.27 and 34.05 RCW. 05-01-014, § 51-50-1405, filed 12/2/04, effective 7/1/05.]

WAC 51-50-1602 Reserved.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 10-03-097, § 51-50-1602, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 70.92, 19.27, and 34.05 RCW. 07-01-091, § 51-50-1602, filed 12/19/06, effective 7/1/07.]

WAC 51-50-1607 Reserved.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 10-03-097, § 51-50-1607, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.190, 19.27.020, and chapters 19.27 and 34.05 RCW. 08-01-110, § 51-50-1607, filed 12/18/07, effective 4/1/08. Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 70.92, 19.27, and 34.05 RCW. 07-01-091, § 51-50-1607, filed 12/19/06, effective 7/1/07.]

WAC 51-50-1609 Section 1609—Wind loads.

1609.1.1 Determination of wind loads. Wind loads on every building or structure shall be determined in accordance with Chapter 6 of ASCE 7 or provisions of the alternate all-heights method in Section 1609.6. The type of opening protection required, the basic wind speed and the exposure category for a site is permitted to be determined in accordance with Section 1609 or ASCE 7. Wind shall be assumed to come from any horizontal direction and wind pressures shall be assumed to act normal to the surface considered.

EXCEPTIONS:
1. Subject to the limitations of Section 1609.1.1.1, the provisions of ICC 600 shall be permitted for applicable Group R-2 and R-3 buildings.
2. Subject to the limitations of Section 1609.1.1.1, residential structures using the provisions of the AF&PA WFCM.
3. Subject to the limitations of Section 1609.1.1.1, residential structures using the provisions of AISI S230.
4. Designs using NAAMM FP 1001.
5. Designs using TIA-222 for antenna-supporting structures and antennas. In section 2.6.6.2, the extent of Topographic Category 2, escarpments, shall extend 16 times the height of the escarpment.
6. Wind tunnel test in accordance with Section 6.6 of ASCE 7, subject to the limitations in Section 1609.1.1.2.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 10-03-097, § 51-50-1609, filed 1/20/10, effective 7/1/10.]

WAC 51-50-1613 Reserved.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 10-03-097, § 51-50-1613, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.190, 19.27.020, and chapters 19.27 and 34.05 RCW. 08-01-110, § 51-50-1613, filed 12/18/07, effective 4/1/08.]

WAC 51-50-1715 Section 1715—Preconstruction load tests.

1715.5 Exterior window and door assemblies. The design pressure rating of exterior windows and doors in buildings shall be determined in accordance with Section 1715.5.1 or 1715.5.2.

EXCEPTIONS:
1. Structural wind load design pressures for window units smaller than the size tested in accordance with Section 1715.5.1 or 1715.5.2 shall be permitted to be higher than the design value of the tested unit provided such higher pressures are determined by accepted engineering analysis. All components of the small unit shall be the same as the tested unit. Where such calculated design pressures are used, they shall be validated by an additional test of the window unit having the highest allowable design pressure.
2. Custom exterior windows and doors manufactured by a small business shall be exempt from all testing requirements in Section 1715 of the International Building Code provided they meet the applicable provisions of Chapter 24 of the International Building Code.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 10-03-097, amended and recodified as § 51-50-1715, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 70.92, 19.27, and 34.05 RCW. 07-01-091, § 51-50-1714, filed 12/19/06, effective 7/1/07.]

WAC 51-50-2104 Section 2104—Construction.

2104.1 Masonry construction. Masonry construction shall comply with the requirements of Sections 2104.1.1 through 2104.6 and with TMS 602/ACI 530.1/ASCE 6 except as modified by Sections 2104.5 and 2104.6.

2104.5 TMS 602/ACI 530.1/ASCE 6, Article 3.5 D, grout lift heights. Modify items 1.b, 1.c, and 2.b of Article 3.5 D as follows:

3.5 D.1.b When the conditions of Articles 3.5 D.1.a.i and 3.5 D.1.a.ii are met but there are intermediate bond beams within the grout pour, limit the grout lift height to the bottom of the lowest bond beam that is more than 5.33 ft. (1.63 m) above the bottom of the lift, but do not exceed a grout lift height of 12.67 ft. (3.86 m).

3.5 D.1.c When the conditions of Article 3.5 D.1.a.i or Article 3.5 D.1.a.ii are not met, place grout in lifts not exceeding 5.33 ft. (1.63 m).

3.5 D.2.b When placed in masonry that has not cured for at least 4 hours, place in lifts not exceeding 5.33 ft. (1.63 m).

2104.6 TMS 602/ACI 530.1/ASCE 6, Article 3.2F, cleanouts. Modify the first sentence of Article 3.2F as follows:

Provide cleanouts in the bottom course of masonry for each grout pour when the grout pour height exceeds 5.33 ft. (1.63 m).

[Statutory Authority: RCW 19.27.031 and 19.27.074. 10-03-097, § 51-50-2104, filed 1/20/10, effective 7/1/10.]

WAC 51-50-2106 Reserved.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 10-03-097, § 51-50-2106, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 70.92, 19.27, and 34.05 RCW. 07-01-091, § 51-50-2106, filed 12/19/06, effective 7/1/07.]

WAC 51-50-21070 Section 2107—Allowable stress design.

2107.1 General. The design of masonry structures using allowable stress design shall comply with Sections 2106, 2107.2 and the requirements of Chapters 1 and 2 of TMS 402/ACI 530/ASCE 5 except as modified by Sections 2107.3 through 2107.5.

2107.2 Load combinations. Structures and portions thereof shall be designed to resist the most critical effects resulting from the load combinations of Section 1605.3. When using the alternative load combinations of Section 1605.3.2 that include wind or seismic loads, allowable stresses are permitted to be increased by one-third.

2107.6 TMS 402/ACI 530/ASCE 5, Section 1.16.1 anchor bolts. Modify the second paragraph of Section 1.16.1 as follows: Anchor bolts placed in the top of grouted cells and bond beams shall be positioned to maintain a minimum of 1/4 inch (6.4 mm) of fine grout between the bolts and the masonry unit or 1/2 inch (12.7 mm) of coarse grout between the bolts and the masonry unit. Anchor bolts placed in drilled holes in the face shells of hollow masonry units shall be permitted to contact the masonry unit where the bolt passes through the face shell, but the portion of the bolt that is within the grouted cell shall be positioned to maintain a minimum of 1/4 inch (6.4 mm) of fine grout between the head or bent leg of the bolt and the masonry unit or 1/2 inch (12.7 mm) of coarse grout between the head or bent leg of the bolt and the masonry unit.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 10-03-097, § 51-50-21070, filed 1/20/10, effective 7/1/10.]

WAC 51-50-2108 Section 2108—Strength design of masonry.

2108.4 TMS 402/ACI 530/ASCE 5, Section 3.1.6. Modify Section 3.1.6 as follows:

3.1.6 Headed and bent-bar anchor bolts. All embedded bolts shall be grouted in place, except that 1/4 inch (6.4 mm) diameter bolts are permitted to be placed in bed joints that are at least 1/2 inch (12.7 mm) in thickness.

2108.5 TMS 402/ACI 530/ASCE 5, Section 1.16.1 anchor bolts. Modify the second paragraph of Section 1.16.1 as follows: Anchor bolts placed in the top of grouted cells and bond beams shall be positioned to maintain a minimum of 1/4 inch (6.4 mm) of fine grout between the bolts and the masonry unit or 1/2 inch (12.7 mm) of coarse grout between the bolts and the masonry unit. Anchor bolts placed in drilled holes in the face shells of hollow masonry units shall be permitted to contact the masonry unit where the bolt passes through the face shell, but the portion of the bolt that is within the grouted cell shall be positioned to maintain a minimum of 1/4 inch (6.4 mm) of fine grout between the head or bent leg of the bolt and the masonry unit or 1/2 inch (12.7 mm) of coarse grout between the head or bent leg of the bolt and the masonry unit.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 10-03-097, § 51-50-2108, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.020, 19.27.031, 19.27.074 and chapters 19.27 and 34.05 RCW. 05-01-014, § 51-50-2108, filed 12/2/04, effective 7/1/05.]

WAC 51-50-2111 Section 2111—Masonry fireplaces.

2111.7 Fireplaces. Fireplaces shall be provided with each of the following:

1. Tightly fitting flue dampers, operated by a readily accessible manual or approved automatic control.

EXCEPTION: Fireplaces with gas logs shall be installed in accordance with the International Mechanical Code Section 901, except that the standards for liquefied petroleum gas installations shall be NFPA 58 (Liquefied Petroleum Gas Code) and NFPA 54 (National Fuel Gas Code).

2. An outside source for combustion air ducted into the firebox. The duct shall be at least 6 square inches, and shall be provided with an operable outside air duct damper.

EXCEPTION: Washington certified fireplaces shall be installed with the combustion air systems necessary for their safe and efficient combustion and specified by the manufacturer in accordance with the Washington State Building Standard 31-2 (WAC 51-50-31200) and IBC Section 2114 (WAC 51-50-2114).

3. Site built fireplaces shall have tight fitting glass or metal doors, or a flue draft induction fan or as approved for minimizing back-drafting. Factory built fireplaces shall use doors listed for the installed appliance.

2111.7.1 Lintel and throat. Masonry over a fireplace opening shall be supported by a lintel of noncombustible material. The minimum required bearing length on each end of the fireplace opening shall be 4 inches (102 mm). The fireplace throat or damper shall be located a minimum of 8 inches (203 mm) above the top of the fireplace opening.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 10-03-097, § 51-50-2111, filed 1/20/10, effective 7/1/10.]

WAC 51-50-2400 Chapter 24—Glass and glazing.

Section 2405—Sloped glazing and skylights.

2405.3 Screening. Where used in monolithic glazing systems, heat-strengthened glass and fully tempered glass shall have screens installed below the glazing material. The screens and their fastenings shall:

(1) Be capable of supporting twice the weight of the glazing;

(2) Be firmly and substantially fastened to the framing members; and

(3) Be installed within 4 inches (102 mm) of the glass. The screens shall be constructed of a noncombustible material not thinner than No. 12 B&S gage (0.0808 inch) with mesh not larger than 1 inch by 1 inch (25 mm by 25 mm). In a corrosive atmosphere, structurally equivalent noncorrosive screen materials shall be used. Heat strengthened glass, fully tempered glass and wired glass, when used in multiple-layer glazing systems as the bottom glass layer over the walking surface, shall be equipped with screening that conforms to the requirements for monolithic glazing systems.

EXCEPTIONS: In monolithic and multiple-layer sloped glazing systems, the following applies:
1. Fully tempered glass installed without protective screens where glazed between intervening floors at a slope of 30 degrees (0.52 rad) or less from the vertical plane shall have the highest point of the glass 10 feet (3048 mm) or less above the walking surface.
2. Screens are not required below any glazing material, including annealed glass, where the walking surface below the glazing material is permanently protected from the risk of falling glass or the area below the glazing material is not a walking surface.
3. Any glazing material, including annealed glass, is permitted to be installed without screens in the sloped glazing systems of commercial or detached noncombustible greenhouses used exclusively for growing plants and not open to the public, provided that the height of the greenhouse at the ridge does not exceed 30 feet (9144 mm) above grade.
4. Screens shall not be required within individual dwelling units in Groups R-2, R-3 and R-4 where fully tempered glass is used as single glazing or as both panes in an insulating glass unit, and the following conditions are met:
4.1. Each pane of the glass is 16 square feet (1.5 m^2) or less in area.
4.2. The highest point of the glass is 12 feet (3658 mm) or less above any walking surface or other accessible area.
4.3. The glass thickness is 3/16 inch (4.8 mm) or less.
5. Screens shall not be required for laminated glass with a 15 mil (0.38 mm) polyvinyl butyral (or equivalent) interlayer within the following limits:
5.1. Each pane of glass is 16 square feet (1.5 m^2) or less in area.
5.2. The highest point of the glass is 12 feet (3658 mm) or less above a walking surface or other accessible area.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 10-03-097, § 51-50-2400, filed 1/20/10, effective 7/1/10.]

WAC 51-50-2900 Chapter 29—Minimum plumbing fixtures and sanitation facilities.

SECTION 2901—GENERAL.

2901.1 Scope. The provisions of this chapter shall apply to the number of plumbing fixtures and sanitation facilities to be provided in an occupancy regulated by this Code.

2901.2 Minimum requirements. Plumbing fixtures and sanitation facilities shall be provided in the minimum number shown in Table 2902.1 and in this chapter. Where the proposed occupancy is not listed in Table 2902.1, the building official shall determine the fixture and facility requirements based on the occupancy which most nearly resembles the proposed occupancy. The number of occupants used for determining minimum fixtures and facilities shall be computed at the rate of one occupant per unit of net floor area as prescribed in Table 2902.1.

Plumbing fixtures need not be provided for unoccupied buildings or facilities.

SECTION 2902—FIXTURES.

2902.1 Number of fixtures.

2902.1.1 Private offices. Fixtures only accessible to private offices shall not be counted to determine compliance with this section.

2902.1.2 Occupancy load distribution. The occupant load shall be divided equally between the sexes, unless data approved by the building official indicates a different distribution of the sexes.

2902.1.3 Food preparation areas. In food preparation, serving and related storage areas, additional fixture requirements may be dictated by health codes.

2902.1.4 Other requirements. For other requirements for plumbing facilities, see Section 1210 and Chapter 11.

2902.2 Access to fixtures.

2902.2.1 Location. Plumbing fixtures shall be located in each building or conveniently in a building adjacent thereto on the same property.

2902.2.1.1 Toilet rooms. Toilet rooms shall not open directly into a room used for the preparation of food for service to the public or residents of Group R-2 boarding homes and residential treatment facilities licensed by Washington state.

2902.2.2 Multiple tenants. Access to toilets serving multiple tenants shall be through a common use area and not through an area controlled by a tenant.

2902.2.3 Multistory buildings. Required fixtures shall not be located more than one vertical story above or below the area served.

SECTION 2903—FACILITIES.

2903.3 Facilities.

2903.3.1 Requirements. Separate toilet facilities shall be provided for each sex.

EXCEPTION: In occupancies serving 15 or fewer persons, one toilet facility designed for use by no more than one person at a time shall be permitted for use by both sexes.

2903.3.2 Food service establishments. When customers and employees share the same toilet rooms, customer access to the to the toilet rooms shall not pass through food preparation and unpackaged food storage areas.

2903.4 Pay facilities. Required facilities shall be free of charge. Where pay facilities are installed, they shall be in addition to the minimum required facilities.

2903.5 is not adopted.

SECTION 2904—SPECIAL PROVISIONS.

2904.1 Dwelling units. Dwelling units shall be provided with a kitchen sink.

2904.2 Water closet space requirements. The water closet stool in all occupancies shall be located in a clear space not less than 30 inches (762 mm) in width, with a clear space in front of the stool of not less than 24 inches (610 mm).

2904.3 Water. Each required sink, lavatory, bathtub and shower stall shall be equipped with hot and cold running water necessary for its normal operation.

2904.4 Drinking fountains.

2904.4.1 Number. Occupant loads over 30 shall have one drinking fountain for the first 150 occupants, then one per each additional 500 occupants.

EXCEPTIONS:
1. Sporting facilities with concessions serving drinks shall have one drinking fountain for each 1000 occupants.
2. A drinking fountain need not be provided in a drinking or dining establishment.

2904.4.2 Multistory buildings. Drinking fountains shall be provided on each floor having more than 30 occupants in schools, dormitories, auditoriums, theaters, offices and public buildings.

2904.4.3 Penal institutions. Penal institutions shall have one drinking fountain on each cell block floor and one on each exercise floor.

2904.4.4 Location. Drinking fountains shall not be located in toilet rooms.

TABLE 2902.1—MINIMUM PLUMBING FIXTURES[1,2,4,6]

TYPE OF BUILDING OR OCCUPANCY[8]	WATER CLOSETS (fixtures per person) MALE[3]	FEMALE	LAVATORIES[5] (fixtures per person) MALE	FEMALE	BATHTUB OR SHOWER (fixtures per person)
For the occupancies listed below, use 30 square feet (2.79 m²) per occupant for the minimum number of plumbing fixtures.					
Group A **Assembly places—** Conference rooms, dining rooms, drinking establishments, exhibit rooms, gymnasiums, lounges, stages and similar uses including restaurants classified as Group B Occupancies	1:1-25 2:26-75 3:76-125 4:126-200 5:201-300 6:301-400 Over 400, add one fixture for each additional 200 males or 150 females	1:1-25 2:26-75 3:76-125 4:126-200 5:201-300 6:301-400	One per 2 water closets		
For the assembly occupancies listed below, use the number of fixed seating or, where no fixed seating is provided, use 15 square feet (1.39 m²) per occupant for the minimum number of plumbing fixtures.					
Assembly places—[9] Theaters, auditoriums, convention halls, dance floors, lodge rooms, casinos, and such places which have limited time for fixture use (intermissions)	1:1-100 2:101-200 3:201-400 Over 400, add one fixture for each additional 250 males or 50 females	One per 25 Up to 400	1:1-200 2:201-400 3:401-750 Over 750, add one fixture for each additional 500 persons	1:1-200 2:201-400 3:401-750	
Assembly places— Stadiums, arena and other sporting facilities where fixture use is not limited to intermissions	1:1-100 2:101-200 3:201-400 Over 400, add one fixture for each additional 300 males or 100 females	One per 50 Up to 400	1:1-200 2:201-400 3:401-750 Over 750, add one fixture for each additional 500 persons	1:1-200 2:201-400 3:401-750	
For the assembly occupancies listed below, use the number of fixed seating or, where no fixed seating is provided, use 30 square feet (2.79 m²) per occupant for the minimum number of plumbing fixtures.					
Worship places Principal assembly area Educational & activity unit	 One per 150 One per 125	 One per 75 One per 75	 One per 2 water closets One per 2 water closets		
For the occupancies listed below, use 200 square feet (18.58 m²) per occupant for the minimum number of plumbing fixtures.					
Group B and other clerical or administrative employee accessory use	1:1-15 2:16-35 3:36-55 Over 55, add one for each additional 50 persons	1:1-15 2:16-35 3:36-55	One per 2 water closets		
For the occupancies listed below, use 100 square feet (9.3 m²) per student for the minimum number of plumbing fixtures.					

TYPE OF BUILDING OR OCCUPANCY[8]	WATER CLOSETS (fixtures per person) MALE[3]	FEMALE	LAVATORIES[5] (fixtures per person) MALE	FEMALE	BATHTUB OR SHOWER (fixtures per person)
Group E	1:1-15	1:1-15	One per 2 water closets		
Schools - for staff use	2:16-35	2:16-35			
All schools	3:36-55	3:36-55			
(One staff per 20 students)	Over 55, add one fixture for each additional 40 persons				
Schools - for student use	1:1-20	1:1-20	1:1-20	1:1-20	
Day care	2:21-50	2:21-50	2:21-50	2:21-50	
	Over 50, add one fixture for each additional 50 persons		Over 50, add one fixture for each additional 50 persons		
Elementary	One per 30	One per 25	One per 2 water closets		
Secondary	One per 40	One per 30	One per 2 water closets		
For the occupancies listed below, use 50 square feet (4.65 m^2) per occupant for the minimum number of plumbing fixtures.					
Education facilities other than Group E					
Others (colleges, universities, adult centers, etc.)	One per 40	One per 25	One per 2 water closets		
For the occupancies listed below, use 2,000 square feet (185.8 m^2) per occupant for the minimum number of plumbing fixtures.					
Group F and Group H	1:1-10	1:1-10	One per 2 water closets		
Workshop, foundries and similar establishments, and hazardous occupancies	2:11-25	2:11-25			One shower for each 15 persons exposed to excessive heat or to skin contamination with irritating materials
	3:26-50	3:26-50			
	4:51-75	4:51-75			
	5:76-100	5:76-100			
	Over 100, add one fixture for each additional 30 persons				
For the occupancies listed below, use the designated application and 200 square feet (18.58 m^2) per occupant of the general use area for the minimum number of plumbing fixtures.					
Group I[7]					
Hospital waiting rooms	One per room (usable by either sex)		One per room		
Hospital general use areas	1:1-15	1:1-15	One per 2 water closets		
	2:16-35	3:16-35			
	3:36-55	3:36-55			
	Over 55, add one fixture for each additional 40 persons				
Hospital patient rooms:					
Single Bed	One adjacent to and directly accessible from		One per toilet room		One per toilet room
Isolation	One adjacent to and directly accessible from		One per toilet room		One per toilet room
Multibed	One per 4 patients		One per 4 patients		One per 8 patients
Long-term	One per 4 patients		One per 4 patients		One per 15 patients
Jails and reformatories					
Cell	One per cell		One per cell		
Exercise room	One per exercise room		One per exercise room		
Other institutions (on each occupied floor)	One per 25	One per 25	One per 2 water closets		One per 8
For the occupancies listed below, use 200 square feet (18.58 m^2) per occupant for the minimum number of plumbing fixtures.					
Group M					
Retail or wholesale stores	1:1-50	1:1-50	One per 2 water closets		
	2:51-100	2:51-100			
	3:101-400	3:101-200			
		4:201-300			
		5:301-400			

TYPE OF BUILDING OR OCCUPANCY[8]	WATER CLOSETS (fixtures per person) MALE[3]	FEMALE	LAVATORIES[5] (fixtures per person) MALE	FEMALE	BATHTUB OR SHOWER (fixtures per person)
	Over 400, add one fixture for each additional 300 males or 150 females				
For Group R Occupancies containing dwelling units or guest rooms, use the table below. For dormitories, use 200 square feet (18.58 m^2) per occupant for the minimum number of plumbing fixtures.					
Group R Dwelling units Hotel, motel, and boarding house guest rooms	One per dwelling unit One per guest room		One per dwelling unit One per guest room		One per dwelling unit One per guest room
Boarding homes licensed by the department of social and health services	One per 8	One per 8	One per 8	One per 8	One per 12
Dormitories	One per 10 Over 10, add one fixture for each additional 25 males and over 8, add one for each additional 20 females	One per 8	One per 12 Over 12, add one fixture for each additional 20 males and one for each additional 15 females	One per 12	One per 8 For females, add one additional unit per each additional 30. Over 150 persons, add one additional unit per each additional 20 persons
For the occupancies listed below, use 5,000 square feet (464.5 m^2) per occupant for the minimum number of plumbing fixtures.					
Group S Warehouses	1:1-10 2:11-25 3:26-50 4:51-75 5:76-100 Over 100, add one for each 30 persons	1:1-10 2:11-25 3:26-50 4:51-75 5:76-100	One per 40 occupants of each sex		One shower for each 15 persons exposed to excessive heat or to skin contamination with poisonous, infectious or irritating materials

[1]The figures shown are based on one fixture being the minimum required for the number of persons indicated or any fraction thereof.

[2]For occupancies not shown, see Section 2901.2.

[3]Where urinals are provided, one water closet less than the number specified may be provided for each urinal installed, except the number of water closets in such cases shall not be reduced to less than one quarter (25%) of the minimum specified. For men's facilities serving 26 or more persons, not less than one urinal shall be provided.

[4]For drinking fountains, see Section 2904.4.

[5]Twenty-four inches (610 mm) of wash sink or 18 inches (457 mm) of a circular basin, when provided with water outlets for such space, shall be considered equivalent to one lavatory.

[6]For when a facility may be usable by either sex, see Section 2903.3.1.

[7]See WAC 246-320 for definitions, other fixtures and equipment for hospitals.

[8]When a space is accessory to or included as a part of a different occupancy group per Chapter 3, the area per occupant for the minimum plumbing fixture number is to be determined by its own specific use or purpose, not by that of the building's occupancy group.

[9]In multiplex movie theaters, where shows are scheduled at different times, the number of occupants for toilet fixture use may be based upon one-half (50%) of the total in all the auditoriums, but no less than the number in the largest auditorium.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 10-03-097, § 51-50-2900, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 70.92, 19.27, and 34.05 RCW. 07-01-091, § 51-50-2900, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.020, 19.27.031, 19.27.074 and chapters 19.27 and 34.05 RCW. 05-01-014, § 51-50-2900, filed 12/2/04, effective 7/1/05. Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-108, § 51-50-2900, filed 12/17/03, effective 7/1/04.]

WAC 51-50-3001 Reserved.

Section 3002—Hoistway enclosures.

3002.4 Elevator car to accommodate ambulance stretcher. In buildings four stories in height or more, and in buildings which are required to have an elevator and contain Group R-1, R-2 or I Occupancies on a level other than the exit discharge level, at least one elevator shall be provided for fire department emergency access to all floors. Such elevator car shall be of such a size and arrangement to accommodate a 24-inch by 84-inch (610 mm by 2134 mm) ambulance stretcher with not less than 5-inch (127 mm) radius corners, in the horizontal, open position and shall be identified by the international symbol for emergency medical services (star of life). The symbol shall not be less than 3 inches (76 mm) high and shall be placed inside on both sides of the hoistway door frame.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 10-03-097, § 51-50-3001, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.190, 19.27.020, and chapters 19.27 and 34.05 RCW. 08-01-110, § 51-50-3001, filed 12/18/07, effective 4/1/08. Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 70.92, 19.27, and 34.05 RCW. 07-01-091, § 51-50-3001, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-108, § 51-50-3001, filed 12/17/03, effective 7/1/04.]

WAC 51-50-3108 Section 3108—Telecommunications and broadcast towers.

3108.1 General. Towers shall be designed and constructed in accordance with the provisions of TIA-222. In Section

2.6.6.2, the extent of Topographic Category 2, escarpments, shall extend 16 times the height of the escarpment. Towers shall be designed for seismic loads. The exceptions to the requirement of seismic design listed in Section 2.7.3 shall not apply. Class I structures per Table 2-1 of the standard may be exempted from seismic design, if approved by the building official.

EXCEPTION: Single free-standing poles used to support antennas not greater than 75 feet (22,860 mm), measured from the top of the pole to grade, shall not be required to be noncombustible.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 10-03-097, § 51-50-3108, filed 1/20/10, effective 7/1/10.]

WAC 51-50-3401 Section 3401—General.

3401.5 Alternative compliance. Work performed in accordance with the 2009 International Existing Building Code as amended in WAC 51-50-480000 shall be deemed to comply with the provisions of this chapter.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 10-03-097, § 51-50-3401, filed 1/20/10, effective 7/1/10.]

WAC 51-50-3404 Section 3404—Alterations.

3404.1 General. Except as provided by Section 3401.4 or this section, alterations to any building or structure shall comply with the requirements of the Code for new construction. Alterations shall be such that the existing building or structure is no less conforming with the provisions of this Code than the existing building or structure was prior to the alteration.

EXCEPTIONS:
1. An existing stairway shall not be required to comply with the requirements of Section 1009 where the existing space and construction does not allow a reduction in pitch or slope.
2. Handrails otherwise required to comply with Section 1009.12 shall not be required to comply with the requirements of Section 1012.6 regarding full extension of the handrails where such extensions would be hazardous due to plan configuration.
3. In buildings considered existing structures on July 1, 2010, dwelling units shall be permitted to have a ceiling height of not less than 7 feet (2134 mm).

[Statutory Authority: RCW 19.27.031 and 19.27.074. 10-03-097, § 51-50-3404, filed 1/20/10, effective 7/1/10.]

WAC 51-50-3410 Section 3410—Moved structures.

3410.1 Conformance. Buildings or structures moved into or within the jurisdiction shall comply with the provisions of this code, the International Residential Code (chapter 51-51 WAC), the International Mechanical Code (chapter 51-52 WAC), the International Fire Code (chapter 51-54 WAC), the Uniform Plumbing Code and Standards (chapters 51-56 and 51-57 WAC), the Washington State Energy Code (chapter 51-11 WAC) and the Washington State Ventilation and Indoor Air Quality Code (chapter 51-13 WAC) for new buildings or structures.

EXCEPTION: Group R-3 buildings or structures are not required to comply if:
1. The original occupancy classification is not changed; and
2. The original building is not substantially remodeled or rehabilitated.

For the purposes of this section, a building shall be considered to be substantially remodeled when the costs of remodeling exceed 60 percent of the value of the building exclusive of the costs relating to preparation, construction, demolition or renovation of foundations.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 10-03-097, amended and recodified as § 51-50-3410, filed 1/20/10, effective 7/1/10; 04-01-108, § 51-50-3408, filed 12/17/03, effective 7/1/04.]

WAC 51-50-3411 Section 3411—Accessibility for existing buildings.

3411.7 Alterations affecting an area containing a primary function. Where an alteration affects the accessibility to, or contains an area of primary function, the route to the primary function area shall be accessible. The accessible route to the primary function area shall include toilet facilities, telephones or drinking fountains serving the area of primary function.

EXCEPTIONS:
1. The costs of providing the accessible route are not required to exceed 20 percent of the costs of the alteration affecting the area of primary function.
2. This provision does not apply to alterations limited solely to windows, hardware, operating controls, electrical outlets and signs.
3. This provision does not apply to alterations limited solely to mechanical systems, electrical systems, installation or alteration of fire protection systems and abatement of hazardous materials.
4. This provision does not apply to alterations undertaken for the primary purpose of increasing the accessibility of an existing building, facility or element.

3411.8.11 Toilet rooms. Where it is technically infeasible to alter existing toilet and bathing facilities to be accessible, an accessible family or assisted use toilet or bathing facility constructed in accordance with Section 1109.2.1 is permitted. The family or assisted use facility shall be located on the same floor and in the same area as the existing facility. The number of toilet facilities and water closets required by the State Building Code is permitted to be reduced by one, in order to provide accessible features.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 10-03-097, amended and recodified as § 51-50-3411, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 70.92, 19.27, and 34.05 RCW. 07-01-091, § 51-50-3409, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-108, § 51-50-3409, filed 12/17/03, effective 7/1/04.]

WAC 51-50-480000 2009 International Existing Building Code.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 10-03-097, § 51-50-480000, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 70.92, 19.27, and 34.05 RCW. 07-01-091, § 51-50-480000, filed 12/19/06, effective 7/1/07.]

WAC 51-50-480101 Section 101—General.

101.4 Applicability. When requested by the permit applicant, this code shall apply to the repair, alteration, change of occupancy and relocation of buildings existing on the date of adoption of this code, regardless of occupancy, subject to the criteria of Sections 101.4.1 and 101.4.2. When compliance with this code has not been requested, compliance with the State Building Code as adopted in Title 51 WAC shall be demonstrated.

101.4.1 Buildings not previously occupied. A building or portion of a building that has not been previously occupied or used for its intended purpose in accordance with the laws in existence at the time of its completion shall comply with the provisions of the State Building Code adopted in Title 51 WAC, for new construction or with any current permit for such occupancy.

101.4.2 Buildings previously occupied. The legal occupancy of any building existing on the date of adoption of this code shall be permitted to continue without change, except as is specifically covered in this code, the International Fire Code, or as deemed necessary by the code official to mitigate an unsafe building. For the purpose of this section, "unsafe building" is not to be construed as mere lack of compliance with the current code.

101.7 Appendices. The code official is authorized to require rehabilitation and retrofit of buildings, structures, or individual structural members in accordance with the appendices of this code if such appendices have been individually adopted. Appendix A, Guidelines for the Seismic Retrofit of Existing Buildings, is hereby adopted as part of this code without any specific adoption by the local jurisdiction.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 10-03-097, § 51-50-480101, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 70.92, 19.27, and 34.05 RCW. 07-01-091, § 51-50-480101, filed 12/19/06, effective 7/1/07.]

WAC 51-50-480102 Section 102—Applicability.

102.4.1 Fire prevention. The provisions of the International Fire Code shall apply to matters affecting or relating to structures, processes and premises regarding: The hazard of fire and explosion arising from the storage, handling or use of structures, materials or devices; conditions hazardous to life, property or public welfare in the occupancy of structures or premises; and the construction, extension, repair, alteration or removal of fire suppression and alarm systems or fire hazards in the structure or on the premises from occupancy or operation except as specifically provided for in this Code.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 10-03-097, § 51-50-480102, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 70.92, 19.27, and 34.05 RCW. 07-01-091, § 51-50-480102, filed 12/19/06, effective 7/1/07.]

WAC 51-50-480302 Reserved.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 10-03-097, § 51-50-480302, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 70.92, 19.27, and 34.05 RCW. 07-01-091, § 51-50-480302, filed 12/19/06, effective 7/1/07.]

WAC 51-50-480305 Reserved.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 10-03-097, § 51-50-480305, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 70.92, 19.27, and 34.05 RCW. 07-01-091, § 51-50-480305, filed 12/19/06, effective 7/1/07.]

WAC 51-50-480307 Section 307—Change of occupancy.

[B] 307.1 Conformance. No change shall be made in the use or occupancy of any building that would place the building in a different division of the same group of occupancy or in a different group of occupancies, unless such building is made to comply with the requirements of the International Building Code for such division or group of occupancy. Subject to the approval of the building official, the use or occupancy of existing buildings shall be permitted to be changed and the building is allowed to be occupied for purposes in other groups without conforming to all the requirements of the International Building Code for those groups, provided the new or proposed use is less hazardous, based on life and fire risk, than the existing use. The hazard tables of Chapter 9 may be used to demonstrate the relative fire and life risk of the existing and the new proposed uses.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 10-03-097, § 51-50-480307, filed 1/20/10, effective 7/1/10.]

Reviser's note: The brackets and enclosed material in the text of the above section occurred in the copy filed by the agency.

WAC 51-50-480506 Reserved.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 10-03-097, § 51-50-480506, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 70.92, 19.27, and 34.05 RCW. 07-01-091, § 51-50-480506, filed 12/19/06, effective 7/1/07.]

WAC 51-50-480607 Section 607—Energy conservation.

607.1 Minimum requirements. Level 1 alterations to existing buildings or structures shall comply with the Washington State Energy Code (chapter 51-11 WAC).

[Statutory Authority: RCW 19.27.031 and 19.27.074. 10-03-097, § 51-50-480607, filed 1/20/10, effective 7/1/10.]

WAC 51-50-480711 Section 711—Energy conservation.

711.1 Minimum requirements. Level 2 alterations to existing buildings or structures shall comply with the Washington State Energy Code (chapter 51-11 WAC).

[Statutory Authority: RCW 19.27.031 and 19.27.074. 10-03-097, § 51-50-480711, filed 1/20/10, effective 7/1/10.]

WAC 51-50-480807 Section 807—Structural.

807.4.1 Evaluation and analysis. An engineering evaluation and analysis that establishes the structural adequacy of the altered structure shall be prepared by a registered design professional and submitted to the code official. For structures assigned to Seismic Design Category D, the registered design professional shall submit to the code official a seismic evaluation report of the existing building based on one of the procedures specified in Section 101.5.4.2. This seismic evaluation report shall not be required for buildings in compliance with the benchmark building provisions of ASCE 31, Section 3.2.

807.4.2 Substantial structural alteration. Any building or structure undergoing substantial improvement shall have an evaluation and analysis to demonstrate that the altered building or structure complies with the *International Building Code* for wind loading and with reduced *International Building Code* level seismic forces as specified in Section 101.5.4.2 for seismic loading. For seismic considerations, the

analysis shall be based on one of the procedures specified in Section 101.5.4.

807.4.3 Limited structural alteration. Where any building or structure undergoes less than substantial improvement, the evaluation and analysis shall demonstrate that the altered building or structure complies with the loads applicable at the time the building was constructed.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 10-03-097, § 51-50-480807, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 70.92, 19.27, and 34.05 RCW. 07-01-091, § 51-50-480807, filed 12/19/06, effective 7/1/07.]

WAC 51-50-480808 Section 808—Energy conservation.

808.1 Minimum requirements. Level 3 alterations to existing buildings or structures shall comply with the Washington State Energy Code (chapter 51-11 WAC).

[Statutory Authority: RCW 19.27.031 and 19.27.074. 10-03-097, § 51-50-480808, filed 1/20/10, effective 7/1/10.]

WAC 51-50-481101 Chapter 11—Historic buildings—Section 1101—General.

1101.1 Scope. It is the intent of this chapter to provide means for the preservation of historic buildings as defined in Chapter 2. It is the purpose of this chapter to encourage cost-effective preservation of original or restored architectural elements and features and to provide a historic building that will result in a reasonable degree of safety, based on accepted life and fire safety practices, compared to the existing building. Historical buildings shall comply with the provisions of this chapter relating to their repair, alteration, relocation and change of occupancy.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 10-03-097, § 51-50-481101, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 70.92, 19.27, and 34.05 RCW. 07-01-091, § 51-50-481101, filed 12/19/06, effective 7/1/07.]

WAC 51-50-481102 Reserved.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 10-03-097, § 51-50-481102, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 70.92, 19.27, and 34.05 RCW. 07-01-091, § 51-50-481102, filed 12/19/06, effective 7/1/07.]

WAC 51-50-481104 Alterations.

1104.1 Accessibility requirements. The provisions of Sections 605 and 706 shall apply to buildings and facilities designated as historic structures that undergo alterations, unless technically infeasible. Where compliance with the requirements for accessible routes, ramps, entrances, or toilet facilities would threaten or destroy the historic significance of the building or facility, as determined by the professional responsible for the historical documentation of the project, the alternative requirements of Sections 1104.1.1 through 1104.1.4 for that element shall be permitted.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 10-03-097, § 51-50-481104, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 70.92, 19.27, and 34.05 RCW. 07-01-091, § 51-50-481104, filed 12/19/06, effective 7/1/07.]

WAC 51-50-481106 Reserved.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 10-03-097, § 51-50-481106, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 70.92, 19.27, and 34.05 RCW. 07-01-091, § 51-50-481106, filed 12/19/06, effective 7/1/07.]

WAC 51-50-481201 Section 1201—General.

1201.1 Conformance. Buildings or structures moved into or within the jurisdiction shall comply with the provisions of this code, the International Residential Code (chapter 51-51 WAC), the International Mechanical Code (chapter 51-52 WAC), the International Fire Code (chapter 51-54 WAC), the Uniform Plumbing Code and Standards (chapters 51-56 and 51-57 WAC), the Washington State Energy Code (chapter 51-11 WAC) and the Washington State Ventilation and Indoor Air Quality Code (chapter 51-13 WAC) for new buildings or structures.

EXCEPTION: Group R-3 buildings or structures are not required to comply if:
1. The original occupancy classification is not changed; and
2. The original building is not substantially remodeled or rehabilitated.

For the purposes of this section, a building shall be considered to be substantially remodeled when the costs of remodeling exceed 60 percent of the value of the building exclusive of the costs relating to preparation, construction, demolition or renovation of foundations.

SECTION 1202—REQUIREMENTS. This section not adopted.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 10-03-097, § 51-50-481201, filed 1/20/10, effective 7/1/10.]

WAC 51-50-481301 Reserved.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 10-03-097, § 51-50-481301, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 70.92, 19.27, and 34.05 RCW. 07-01-091, § 51-50-481301, filed 12/19/06, effective 7/1/07.]

WAC 51-50-481500 Reserved.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 10-03-097, § 51-50-481500, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 70.92, 19.27, and 34.05 RCW. 07-01-091, § 51-50-481500, filed 12/19/06, effective 7/1/07.]

Chapter 51-51 WAC

STATE BUILDING CODE ADOPTION AND AMENDMENT OF THE 2009 EDITION OF THE INTERNATIONAL RESIDENTIAL CODE

WAC

51-51-003 International Residential Code.
51-51-008 Implementation.
51-51-0102 Section R102—Applicability.
51-51-0202 Section R202—Definitions.
51-51-0301 Reserved.
51-51-0302 Section R302—Fire-resistant construction.
51-51-0303 Section R303—Light, ventilation and heating.
51-51-0311 Section R311—Means of egress.
51-51-0313 Section R313—Automatic fire sprinkler systems.
51-51-0314 Section R314—Smoke alarms.
51-51-0315 Section R315—Carbon monoxide alarms.
51-51-0317 Reserved.
51-51-0322 Section R322—Flood resistant construction.
51-51-0325 Section R325—Adult family homes.
51-51-0403 Section R403—Footings.
51-51-0404 Section R404—Foundation and retaining walls.

51-51-0408 Section R408—Under-floor space.
51-51-0502 Section R502—Wood floor framing.
51-51-0602 Section R602—Wood wall framing.
51-51-0612 Section R612—Exterior windows and glass doors.
51-51-0702 Section R702—Interior covering.
51-51-0703 Section R703—Exterior covering.
51-51-0806 Section R806—Roof ventilation.
51-51-0903 Section R903—Weather protection.
51-51-1001 Section R1001—Masonry fireplaces.
51-51-1006 Section R1006—Exterior air supply.
51-51-1302 Section M1302—General mechanical system requirements.
51-51-1415 Section M1415—Masonry heaters.
51-51-1501 Reserved.
51-51-1507 Section M1507—Mechanical ventilation.
51-51-1508 Section M1508—Whole house ventilation.
51-51-1600 Chapter 16—Duct systems.
51-51-1700 Chapter 17—Combustion air.
51-51-2439 Reserved.
51-51-4400 Chapter 44—Referenced standards.
51-51-60105 Appendix R—Dwelling unit fire sprinkler systems.
51-51-60107 Appendix S—Fire sprinklers.

DISPOSITION OF SECTIONS FORMERLY CODIFIED IN THIS CHAPTER

51-51-0613 Section R613—Exterior windows and glass doors. [Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 19.27 and 34.05 RCW. 07-01-090, § 51-51-0613, filed 12/19/06, effective 7/1/07.] Decodified and amended by 10-03-098, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.031 and 19.27.074. Recodified as WAC 51-51-0612.

51-51-4300 Chapter 43—Referenced standards. [Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 19.27 and 34.05 RCW. 07-01-090, § 51-51-4300, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-109, § 51-51-4300, filed 12/17/03, effective 7/1/04.] Decodified and amended by 10-03-098, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.031 and 19.27.074. Recodified as WAC 51-51-4400.

WAC 51-51-003 International Residential Code. The 2009 edition of the *International Residential Code* as published by the International Code Council is hereby adopted by reference with the following additions, deletions, and exceptions: Provided that chapters 11 and 25 through 43 of this code are not adopted. Energy Code is regulated by chapter 51-11 WAC; Plumbing Code is regulated by chapter 51-56 WAC; Electrical Code is regulated by chapter 296-46B WAC or Electrical Code as adopted by the local jurisdiction. Appendix G, Swimming Pools, Spas and Hot Tubs, is included in adoption of the International Residential Code.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 10-03-098, § 51-51-003, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 19.27 and 34.05 RCW. 07-01-090, § 51-51-003, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-109, § 51-51-003, filed 12/17/03, effective 7/1/04.]

WAC 51-51-008 Implementation. The International Residential Code adopted by chapter 51-51 Washington Administrative Code (WAC) shall become effective in all counties and cities of this state on July 1, 2010.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 10-03-098, § 51-51-008, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 19.27 and 34.05 RCW. 07-01-090, § 51-51-008, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-109, § 51-51-008, filed 12/17/03, effective 7/1/04.]

WAC 51-51-0102 Section R102—Applicability.

R102.5 Appendices. Provisions in the appendices shall not apply unless specifically referenced in the adopting ordinance. Except for Appendix S, Fire Sprinklers, an appendix adopted by a local jurisdiction shall not be effective unless approved by the state building code council pursuant to RCW 19.27.060 (1)(a). The state building code council has determined that a local ordinance requiring fire sprinklers in accordance with Appendix S of this chapter may be adopted by any local government upon notification of the council.

Appendix G, Swimming Pools, Spas and Hot Tubs, and Appendix R, Dwelling Unit Fire Sprinkler Systems, are included in adoption of the International Residential Code.

R102.7.1 Additions, alterations or repairs. Additions, alterations or repairs to any structure shall conform to the requirements for a new structure without requiring the existing structure to comply with all of the requirements of this code, unless otherwise stated. Additions, alterations or repairs shall not cause an existing structure to become unsafe or adversely affect the performance of the building.

EXCEPTIONS:
1. Additions with less than 500 square feet of conditioned floor area are exempt from the requirements for Whole House Ventilation Systems, Section M1508.
2. Additions or alterations to existing buildings which do not require the construction of foundations, crawlspaces, slabs or basements shall not be required to meet the requirements for radon protection in Section R327.1 and Appendix F.

R102.7.2 Moved buildings. Buildings or structures moved into or within a jurisdiction shall comply with the provisions of this code, the International Building Code (chapter 51-50 WAC), the International Mechanical Code (chapter 51-52 WAC), the International Fire Code (chapter 51-54 WAC), the Uniform Plumbing Code and Standards (chapters 51-56 and 51-57 WAC), the Washington State Energy Code (chapter 51-11 WAC) and the Washington State Ventilation and Indoor Air Quality Code (chapter 51-13 WAC) for new buildings or structures.

EXCEPTION: Group R-3 buildings or structures are not required to comply if:
1. The original occupancy classification is not changed; and
2. The original building is not substantially remodeled or rehabilitated. For the purposes of this section a building shall be considered to be substantially remodeled when the costs of remodeling exceed 60 percent of the value of the building exclusive of the costs relating to preparation, construction, demolition or renovation of foundations.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 10-03-098, § 51-51-0102, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 19.27 and 34.05 RCW. 07-01-090, § 51-51-0102, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-109, § 51-51-0102, filed 12/17/03, effective 7/1/04.]

WAC 51-51-0202 Section R202—Definitions.

ADULT FAMILY HOME means a dwelling in which a person or persons provide personal care, special care, room and board to more than one but not more than six adults who are not related by blood or marriage to the person or persons providing the services.

AIR-IMPERMEABLE INSULATION. An insulation having an air permeance equal to or less than 0.02 L/s-m^2 at 75 Pa pres-

sure differential tested in accordance with ASTM E2178 or ASTM E283.

ATTIC, HABITABLE. A conditioned area, not considered a story, complying with all of the following requirements:

1. The occupiable floor area is at least 70 square feet (6.5 m^2), in accordance with Section R304.

2. The occupiable floor area has a ceiling height in accordance with Section R305.

3. The occupiable space is enclosed by the roof assembly above, knee walls (if applicable) on the sides, and the floor-ceiling assembly below.

CHILD DAY CARE, shall, for the purposes of these regulations, mean the care of children during any period of a 24 hour day.

CHILD DAY CARE HOME, FAMILY is a child day care facility, licensed by the state, located in the dwelling of the person or persons under whose direct care and supervision the child is placed, for the care of twelve or fewer children, including children who reside at the home.

DWELLING UNIT. A single unit providing complete independent living facilities for one or more persons, including permanent provisions for living, sleeping, eating, cooking and sanitation. Dwelling units may also include the following uses:

1. Adult family homes, foster family care homes and family day care homes licensed by the Washington state department of social and health services.

2. Offices, mercantile, food preparation for off-site consumption, personal care salons or similar uses which are conducted primarily by the occupants of the dwelling unit and are secondary to the use of the unit for dwelling purposes, and which do not exceed 500 square feet (46.4 m^2).

3. Owner-occupied dwellings with 5 or fewer guest rooms.

FIRE SEPARATION DISTANCE. The distance measured from the foundation wall or face of the wall framing, whichever is closer, to one of the following:

1. To the closest interior lot line; or

2. To the centerline of a street, an alley or public way; or

3. To an imaginary line between two buildings on the lot.

The distance shall be measured at a right angle from the wall.

SMALL BUSINESS. Any business entity (including a sole proprietorship, corporation, partnership or other legal entity) which is owned and operated independently from all other businesses, which has the purpose of making a profit, and which has fifty or fewer employees, or which has a million dollars or less per year in gross sales, of window products.

SOURCE SPECIFIC VENTILATION SYSTEM. A mechanical ventilation system including all fans, controls, and ducting, which is dedicated to exhausting contaminant-laden air to the exterior of the building from the room or space in which the contaminant is generated.

WHOLE HOUSE VENTILATION SYSTEM. A mechanical ventilation system, including fans, controls, and ducts, which replaces, by direct or indirect means, air from the habitable rooms with outdoor air.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 10-03-098, § 51-51-0202, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.190, 19.27.020, and chapters 19.27 and 34.05 RCW. 09-04-023, § 51-51-0202, filed 1/27/09, effective 7/1/09; 08-01-102, § 51-51-0202, filed 12/18/07, effective 4/1/08. Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 19.27 and 34.05 RCW. 07-01-090, § 51-51-0202, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-109, § 51-51-0202, filed 12/17/03, effective 7/1/04.]

WAC 51-51-0301 Reserved.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 10-03-098, § 51-51-0301, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.190, 19.27.020, and chapters 19.27 and 34.05 RCW. 08-01-102, § 51-51-0301, filed 12/18/07, effective 4/1/08.]

WAC 51-51-0302 Section R302—Fire-resistant construction.

R302.1 Exterior walls. Construction, projections, openings and penetrations of exterior walls of dwellings and accessory buildings shall comply with Table R302.1.

EXCEPTIONS:

1. Walls, projections, openings or penetrations in walls perpendicular to the line used to determine the fire separation distance.
2. Walls of dwellings and accessory structures located on the same lot.
3. Detached tool sheds and storage sheds, playhouses and similar structures exempted from permits are not required to provide protection based on location on the lot. Projections beyond the exterior wall shall not extend over the lot line.
4. Detached garages accessory to a dwelling located within 2 feet (610 mm) of a lot line are permitted to have roof eave projections not exceeding 4 inches (102 mm).
5. Foundation vents installed in compliance with this code are permitted.

Table R302.1
Exterior Walls

Exterior Wall Element		Minimum Fire-Resistance Rating	Minimum Fire Separation Distance
Walls	(Fire-resistance rated)	1-hour tested in accordance with ASTM E 119 or UL 263 with exposure from both sides	< 5 feet
	(Not fire-resistance rated)	0 hours	> 5 feet
Projections	(Fire-resistance rated)	1 hour on the underside[ab]	> 2 feet to 5 feet
	(Not fire-resistance rated)	0 hours	5 feet
Openings in Walls	Not allowed	N/A	< 3 feet
	25% maximum of wall area	0 hours	3 feet

Exterior Wall Element		Minimum Fire-Resistance Rating	Minimum Fire Separation Distance
	Unlimited	0 hours	5 feet
Penetrations	All	Comply with Section R302.4	< 5 feet
		None required	5 feet

For IS: 1 foot = 304.8 mm. N/A = Not Applicable
a. Roof eave fire-resistance rating shall be permitted to be reduced to 0 hours on the underside of the eave if fire blocking is provided from the wall top plate to the underside of the roof sheathing.
b. Roof eave fire-resistance rating shall be permitted to be reduced to 0 hours on the underside of the eave provided no gable vent openings are installed.

R302.2 Townhouses. Each townhouse shall be considered a separate building and shall be separated by fire-resistance-rated wall assemblies meeting the requirements of Section R302.1 for exterior walls.

EXCEPTION: (1) A common 1-hour fire-resistance rated wall assembly tested in accordance with ASTM E 119 or UL 263 is permitted for townhouses where an automatic sprinkler system is installed in accordance with NFPA 13 D, if such walls do not contain plumbing or mechanical equipment, ducts or vents in the cavity of the common wall. The wall shall be rated for fire exposure from both sides and shall extend to and be tight against exterior walls and the underside of the roof sheathing. Electrical installations shall be installed in accordance with chapter 296-46B WAC or electrical code as adopted by the local jurisdiction. Penetrations of electrical outlet boxes shall be in accordance with Section R302.4.
(2) A common 2-hour fire-resistance-rated wall assembly tested in accordance with ASTM E 119 or UL 263 is permitted for townhouses if such walls do not contain plumbing or mechanical equipment, ducts or vents in the cavity of the common wall. The wall shall be rated for fire exposure from both sides and shall extend to and be tight against exterior walls and the underside of the roof sheathing. Electrical installations shall be installed in accordance with chapter 296-46B WAC or electrical code as adopted by the local jurisdiction. Penetrations of electrical outlet boxes shall be in accordance with Section R302.4.

R302.2.1 Continuity. The fire-resistance-rated wall or assembly separating townhouses shall be continuous from the foundation to the underside of the roof sheathing, deck or slab. The fire-resistance rating shall extend the full length of the wall or assembly, including wall extensions through and separating attached enclosed accessory structures.

Where a story extends beyond the exterior wall of a story below:

1. The fire-resistance-rated wall or assembly shall extend to the outside edge of the upper story; or

2. The underside of the exposed floor-ceiling assembly shall be protected as required for projections in Section R302.

R302.2.4 Structural independence. Each individual townhouse shall be structurally independent.

EXCEPTIONS: 1. Foundation supporting exterior walls or common walls.
2. Structural roof and wall sheathing from each unit may be fastened to the common wall framing.
3. Nonstructural wall and roof coverings.
4. Flashing at termination of roof covering over common wall.
5. Townhouses separated by a common 2-hour fire-resistance-rated wall as provided in Section R302.2.
6. Floor sheathing may fasten to the floor framing of both units.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 10-03-098, § 51-51-0302, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.190, 19.27.020, and chapters 19.27 and 34.05 RCW. 09-04-023, § 51-51-0302, filed 1/27/09, effective 7/1/09; 08-01-102, § 51-51-0302, filed 12/18/07, effective 4/1/08.]

WAC 51-51-0303 Section R303—Light, ventilation and heating.

R303.1 Natural Light. All habitable rooms shall have an aggregate glazing area of not less than 8 percent of the floor area of such rooms.

EXCEPTION: The glazed areas need not be installed in rooms where artificial light is provided capable of producing an average illumination of 6 footcandles (65 lux) over the area of the room at a height of 30 inches (762 mm) above the floor level.

R303.1.1 Adjoining Rooms. For the purposes of determining light requirements, any room shall be considered as a portion of an adjoining room when at least one-half of the area of the common wall is open and unobstructed and provides an opening of not less than one-tenth of the floor area of the interior room but not less than 25 square feet (2.3 m^2).

EXCEPTION: Openings required for light shall be permitted to open into a thermally isolated sunroom addition or patio cover, provided that there is an openable area between the adjoining room and the sunroom addition or patio cover of not less than one-tenth of the floor area of the interior room but not less than 20 square feet (2 m^2).

R303.2 Minimum Ventilation Performance. Every space intended for human occupancy shall be equipped with source specific and whole house ventilation systems designed and installed as specified in Sections R1507 and R1508.

R303.3 Bathrooms. This section is not adopted.

R303.4.1 Intake Openings. Mechanical and gravity outdoor air intake openings shall be located a minimum of 10 feet (3048 mm) from any hazardous or noxious contaminant, such as vents, chimneys, plumbing vents, streets, alleys, parking lots and loading docks, except as otherwise specified in this code. Where a source of contaminant is located within 10 feet (3048 mm) of an intake opening, such opening shall be located a minimum of 3 feet (914 mm) below the contaminant source.

For the purposes of this section, the exhaust from dwelling unit toilet rooms, bathrooms and kitchens shall not be considered as hazardous or noxious.

R303.6 Stairway Illumination. All interior and exterior stairways shall be provided with a means to illuminate the stairs, including the landings and treads. Stairway illumination shall receive primary power from the building wiring. Interior stairways shall be provided with an artificial light source located in the immediate vicinity of each landing of the stairway. For interior stairs the artificial light sources shall be capable of illuminating treads and landings to levels not less than 1 foot-candle (11 lux) measured at the center of treads and landings. Exterior stairways shall be provided with an artificial light source located in the immediate vicinity of the top landing of the stairway. Exterior stairways providing

access to a basement from the outside grade level shall be provided with an artificial light source located in the immediate vicinity of the bottom landing of the stairway.

EXCEPTION: An artificial light source is not required at the top and bottom landing, provided an artificial light source is located directly over each stairway section.

R303.6.1 Light Activation. Where lighting outlets are installed in interior stairways, there shall be a wall switch at each floor level to control the lighting outlet where the stairway has six or more risers. The illumination of exterior stairways shall be controlled from inside the dwelling unit.

EXCEPTION: Lights that are continuously illuminated or automatically controlled.

R303.8.1 Definitions. For the purposes of this section only, the following definitions apply.

DESIGNATED AREAS are those areas designated by a county to be an urban growth area in chapter 36.70A RCW and those areas designated by the U.S. Environmental Protection Agency as being in nonattainment for particulate matter.

SUBSTANTIALLY REMODELED means any alteration or restoration of a building exceeding 60 percent of the appraised value of such building within a 12 month period. For the purpose of this section, the appraised value is the estimated cost to replace the building and structure in kind, based on current replacement costs.

R303.8.2 Primary Heating Source. Primary heating sources in all new and substantially remodeled buildings in designated areas shall not be dependent upon wood stoves.

R303.8.3 Solid Fuel Burning Devices. No used solid fuel burning device shall be installed in new or existing buildings unless such device is United States Environmental Protection Agency certified or a pellet stove either certified or exempt from certification by the United States Environmental Protection Agency.

EXCEPTION: Antique wood cook stoves and heaters manufactured prior to 1940.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 10-03-098, § 51-51-0303, filed 1/20/10, effective 7/1/10; 04-01-109, § 51-51-0303, filed 12/17/03, effective 7/1/04.]

WAC 51-51-0311 Section R311—Means of egress.

R311.4 Vertical egress. Egress from habitable levels including habitable attics and basements not provided with an egress door in accordance with Section R311.2 shall be by ramp in accordance with Section R311.8 or a stairway in accordance with Section R311.7.

EXCEPTION: Stairs or ladders within an individual dwelling unit used for access to areas of 200 square feet (18.6 m^2) or less, and not containing the primary bathroom or kitchen.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 10-03-098, § 51-51-0311, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 19.27 and 34.05 RCW. 07-01-090, § 51-51-0311, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-109, § 51-51-0311, filed 12/17/03, effective 7/1/04.]

WAC 51-51-0313 Section R313—Automatic fire sprinkler systems.

This section not adopted.

[Statutory Authority: Chapter 19.27 RCW. 10-18-036, § 51-51-0313, filed 8/25/10, effective 9/25/10. Statutory Authority: RCW 19.27.031 and 19.27.074. 10-03-098, § 51-51-0313, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 19.27 and 34.05 RCW. 07-01-090, § 51-51-0313, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-109, § 51-51-0313, filed 12/17/03, effective 7/1/04.]

WAC 51-51-0314 Section R314—Smoke alarms.

R314.3 Location. Smoke alarms shall be installed in the following locations:

1. In each sleeping room.

2. Outside each separate sleeping area in the immediate vicinity of the bedrooms.

3. On each additional story of the dwelling, including basements but not including crawl spaces and uninhabitable attics. In dwellings or dwelling units with split levels and without an intervening door between the adjacent levels, a smoke alarm installed on the upper level shall suffice for the adjacent lower level provided that the lower level is less than one full story below the upper level.

4. In napping areas in family child day care homes.

When more than one smoke alarm is required to be installed within an individual dwelling unit, the alarm devices shall be interconnected in such a manner that the actuation of one alarm will activate all of the alarms in the individual unit.

R314.3.1 Alterations, Repairs and Additions. When alterations, repairs or additions requiring a permit occur, or when one or more sleeping rooms are added or created in existing dwellings, the individual dwelling unit shall be equipped with smoke alarms as required for new dwellings.

EXCEPTIONS: 1. Work involving the exterior surfaces of dwellings, such as the replacement of roofing or siding, or the addition or replacement of windows or doors, or the addition of a porch or deck are exempt from the requirements of this section.
2. Installation, alteration or repairs of plumbing, electrical or mechanical systems are exempt from the requirements of this section.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 10-03-098, § 51-51-0314, filed 1/20/10, effective 7/1/10.]

WAC 51-51-0315 Section R315—Carbon monoxide alarms.

R315.1 Carbon Monoxide Alarms. For new construction, an approved carbon monoxide alarm shall be installed by January 1, 2011, outside of each separate sleeping area in the immediate vicinity of the bedroom in dwelling units. In a building where a tenancy exists, the tenant shall maintain the CO alarm as specified by the manufacturer including replacement of the batteries.

R315.2 Existing Dwellings. Existing dwellings shall be equipped with carbon monoxide alarms by July 1, 2011.

EXCEPTION: Owner-occupied detached one-family dwellings legally occupied prior to July 1, 2010.

R315.3 Alarm Requirements. Single station carbon monoxide alarms shall be listed as complying with UL 2034 and

shall be installed in accordance with this code and the manufacturer's installation instructions.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 10-03-098, § 51-51-0315, filed 1/20/10, effective 7/1/10.]

WAC 51-51-0317 Reserved.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 10-03-098, § 51-51-0317, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.190, 19.27.020, and chapters 19.27 and 34.05 RCW. 08-01-102, § 51-51-0317, filed 12/18/07, effective 4/1/08. Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 19.27 and 34.05 RCW. 07-01-090, § 51-51-0317, filed 12/19/06, effective 7/1/07.]

WAC 51-51-0322 Section R322—Flood resistant construction.

R322.2.1 Elevation Requirements.

1. Buildings and structures in flood hazard areas not designated as Coastal A Zones, shall have the lowest floor elevated to or above the design flood elevation, or a greater elevation as designated by local ordinance.

2. Buildings and structures in flood hazard areas designated as Coastal A Zones shall have the lowest floors elevated to or above the base flood elevation plus 1 foot (305 mm), or to the design flood elevation, whichever is higher.

3. In areas of shallow flooding (AO Zones), buildings and structures shall have the lowest floor (including basement) elevated at least as high above the highest adjacent grade as the depth number specified in feet on the FIRM, or at least 2 feet (610 mm)if a depth number is not specified.

4. Basement floors that are below grade on all sides shall be elevated to or above the design flood elevation.

EXCEPTION: Enclosed areas below the design flood elevation, including basements whose floors are not below grade on all sides, shall meet the requirements of Section R322.2.2.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 10-03-098, § 51-51-0322, filed 1/20/10, effective 7/1/10.]

WAC 51-51-0325 Section R325—Adult family homes.

SECTION R325
ADULT FAMILY HOMES

R325.1 General. This section shall apply to all newly constructed adult family homes and all existing single family homes being converted to adult family homes. This section shall not apply to those adult family homes licensed by the state of Washington department of social and health services prior to July 1, 2001.

R325.2 Submittal Standards. In addition to those requirements in Section 106.1, the submittal shall identify the project as a Group R-3 Adult Family Home Occupancy. A floor plan shall be submitted identifying the means of egress and the components in the means of egress such as stairs, ramps, platform lifts and elevators. The plans shall indicate the rooms used for clients and the sleeping room classification of each room.

R325.3 Sleeping Room Classification. Each sleeping room in an adult family home shall be classified as:

1. Type S - where the means of egress contains stairs, elevators or platform lifts.

2. Type NS1 - where one means of egress is at grade level or a ramp constructed in accordance with R325.9 is provided.

3. Type NS2 - where two means of egress are at grade level or ramps constructed in accordance with R325.9 are provided.

R325.4 Types of Locking Devices. All bedroom and bathroom doors shall be openable from the outside when locked.

Every closet shall be readily openable from the inside.

Operable parts of door handles, pulls, latches, locks and other devices installed in adult family homes shall be operable with one hand and shall not require tight grasping, pinching or twisting of the wrist. The force required to activate operable parts shall be 5.0 pounds (22.2 N) maximum. Exit doors shall have no additional locking devices.

R325.5 Smoke Alarm Requirements. All adult family homes shall be equipped with smoke alarms installed as required in Section R314. Alarms shall be installed in such a manner so that the fire warning may be audible in all parts of the dwelling upon activation of a single device.

R325.6 Escape Windows and Doors. Every sleeping room shall be provided with emergency escape and rescue windows as required by Section R310. No alternatives to the sill height such as steps, raised platforms or other devices placed by the openings will be approved as meeting this requirement.

R325.7 Fire Apparatus Access Roads and Water Supply for Fire Protection. Adult family homes shall be served by fire apparatus access roads and water supplies meeting the requirements of the local jurisdiction.

R325.8 Grab Bars. Grab bars shall be installed for all water closets and bathtubs and showers. The grab bars shall comply with ICC/ANSI A117.1 Sections 604.5 and 607.4 and 608.3.

EXCEPTION: Grab bars are not required for water closets and bathtubs and showers used exclusively by staff of the adult family home.

R325.9 Ramps. All interior and exterior ramps, when provided, shall be constructed in accordance with Section R311.8 with a maximum slope of 1 vertical to 12 horizontal. The exception to R311.8.1 is not allowed for adult family homes. Handrails shall be installed in accordance with R325.9.1.

R325.9.1 Handrails for Ramps. Handrails shall be installed on both sides of ramps between the slope of 1 vertical to 12 horizontal and 1 vertical and 20 horizontal in accordance with R311.6.3.1 through R311.6.3.3.

R325.10 Stair Treads and Risers. Stair treads and risers shall be constructed in accordance with R311.7.4. Handrails shall be installed in accordance with R325.10.1.

R325.10.1 Handrails for Treads and Risers. Handrails shall be installed on both sides of treads and risers numbering from one riser to multiple risers. Handrails shall be installed in accordance with R311.7.7 through R311.7.7.4.

[Statutory Authority: Chapter 19.27 RCW. 10-18-036, § 51-51-0325, filed 8/25/10, effective 9/25/10. Statutory Authority: RCW 19.27.190, 19.27.020, and chapters 19.27 and 34.05 RCW. 09-04-023, § 51-51-0325, filed 1/27/09, effective 7/1/10. Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 19.27 and 34.05 RCW. 07-01-090, § 51-51-0325, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-109, § 51-51-0325, filed 12/17/03, effective 7/1/04.]

WAC 51-51-0403 Section R403—Footings.

R403.1 General. All exterior walls shall be supported on continuous solid or fully grouted masonry or concrete footings, wood foundations, or other approved structural systems which shall be of sufficient design to accommodate all loads specified in Section R301 and to transmit the resulting loads to the supporting soil within the limitations determined from the characteristics of the soil. Footings shall be supported on undisturbed natural soil or engineered fill. Foundation walls complying with Section R404 or stem walls complying with Section R403.1.3 shall be permitted to support exterior walls, exterior braced wall lines and exterior braced wall panels provided they are supported by continuous footings.

TABLE R403.1
MINIMUM WIDTH OF CONCRETE,
PRECAST OR MASONRY FOOTINGS
(inches)

	LOAD-BEARING VALUE OF SOIL (psf)			
	1,500	2,000	3,000	≥4,000
Conventional light-frame construction				
1 floor[b,c]	12	12	12	12
2 floors[b,c]	15	12	12	12
3 floors[b,c]	23	17	12	12
4-inch brick veneer over light frame or 8-inch hollow concrete masonry				
1-story	12	12	12	12
2-story	21	16	12	12
3-story	32	24	16	12
8-inch solid or fully grouted masonry				
1-story	16	12	12	12
2-story	29	21	14	12
3-story	42	32	21	16

For SI: 1 inch = 25.4 mm, 1 pound per square foot = 0.0479kPa.
a. Where minimum footing width is 12 inches, use of a single wythe of solid or fully grouted 12-inch nominal concrete masonry units is permitted.
b. Represents the number of floors supported.
c. Footings shall be permitted to support a roof in addition to the stipulated number of floors. Footings supporting a roof only shall be as required for supporting one floor.

R403.1.2 Continuous Footing in Seismic Design Categories D_0, D_1 and D_2. The braced wall panels at exterior walls of buildings located in Seismic Design Categories D_0, D_1 and D_2 shall be supported by continuous footings. All required interior braced wall panels shall be supported on footings at intervals not exceeding 50 feet (15,240 mm).

Figure 403.4(1). Note corrected title and labels:

BASEMENT OR CRAWL SPACE WITH PRECAST CONCRETE FOUNDATION WALL BEARING ON CRUSHED STONE

PRECAST CONCRETE FOUNDATION WALL

CRUSHED STONE FOOTING

Figure 403.4(2). Note corrected title and label:

BASEMENT OR CRAWL SPACE WITH PRECAST CONCRETE FOUNDATION WALL ON SPREAD FOOTING

PRECAST CONCRETE FOUNDATION WALL

[Statutory Authority: Chapter 19.27 RCW. 10-24-061, § 51-51-0403, filed 11/29/10, effective 7/1/11. Statutory Authority: RCW 19.27.031 and 19.27.074. 10-03-098, § 51-51-0403, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.190, 19.27.020, and chapters 19.27 and 34.05 RCW. 08-01-103, § 51-51-0403, filed 12/18/07, effective 4/1/08. Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 19.27 and 34.05 RCW. 07-01-090, § 51-51-0403, filed 12/19/06, effective 7/1/07.]

WAC 51-51-0404 Section R404—Foundation and retaining walls.

Table R404.1.1(3). Note corrected title:

10-INCH MASONRY FOUNDATION WALLS WITH REINFORCING WHERE d > 6.75 INCHES[a,c]

R404.1.2.2 Reinforcement for foundation walls. Concrete foundation walls shall be laterally supported at the top except where permitted in R404.1.2.2.1 and R404.1.2.2.2, and at the bottom where required elsewhere in this code. Horizontal reinforcement shall be provided in accordance with Table R404.1.2(1). Vertical reinforcement shall be provided in accordance with Table R404.1.2(2), R404.1.2(3), R404.1.2(4), R404.1.2(5), R404.1.2(6), R404.1.2(7) or R404.1.2(8). Vertical reinforcement for flat basement walls retaining 4 feet (1,219 mm) or more of unbalanced backfill is permitted to be determined in accordance with Table R404.1.2(9).

For basement walls supporting above-grade concrete walls, vertical reinforcement shall be the greater of that required by Tables R404.1.2(2) through R404.1.2(8) or by Section 611.6 for the above-grade wall. In buildings assigned to Seismic Design Category D_0, D_1 or D_2, concrete foundation walls shall also comply with Section R404.1.4.2.

R404.4 Retaining Walls. Retaining walls not supporting a structure that are not laterally supported at the top and that retain in excess of 24 inches (610 mm) of unbalanced fill shall be designed to ensure stability against overturning, sliding, excessive foundation pressure and water uplift. Retaining walls shall be designed for a safety factor of 1.5 against lateral sliding and overturning.

[Statutory Authority: Chapter 19.27 RCW. 10-24-061, § 51-51-0404, filed 11/29/10, effective 7/1/11. Statutory Authority: RCW 19.27.031 and 19.27.074. 10-03-098, § 51-51-0404, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.190, 19.27.020, and chapters 19.27 and 34.05 RCW. 08-01-102, § 51-51-0404, filed 12/18/07, effective 4/1/08. Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 19.27 and 34.05 RCW. 07-01-090, § 51-51-0404, filed 12/19/06, effective 7/1/07.]

WAC 51-51-0408 Section R408—Under-floor space.

R408.1 Ventilation. The under-floor space between the bottom of the floor joists and the earth under any building (except space occupied by a basement) shall have ventilation openings through foundation walls or exterior walls.

R408.2 Openings for under-floor ventilation. The minimum net area of ventilation openings shall not be less than 1 square foot (0.0929 m^2) for each 300 square feet (28 m^2) of under-floor area. One ventilating opening shall be within 3 feet (914 mm) of each corner of the building, except one side of the building shall be permitted to have no ventilation openings. Ventilation openings shall be covered for their height and width with any of the following materials provided that

the least dimension of the covering shall not exceed 1/4 inch (6.4 mm):

1. Perforated sheet metal plates not less than 0.070 inch (1.8 mm) thick.

2. Expanded sheet metal plates not less than 0.047 inch (1.2 mm) thick.

3. Cast-iron grill or grating.

4. Extruded load-bearing brick vents.

5. Hardware cloth of 0.035 inch (0.89 mm) wire or heavier.

6. Corrosion-resistant wire mesh, with the least dimension being 1/8 inch (3.2 mm).

EXCEPTION: The total area of ventilation openings shall be permitted to be reduced to 1/1,500 of the under-floor area where the ground surface is covered with an approved Class I vapor retarder material and the required openings are placed to provide cross ventilation of the space. The installation of operable louvers shall not be prohibited. If the installed ventilation is less than 1/300, or if operable louvers are installed, a radon vent shall be installed to originate from a point between the ground cover and soil. The radon vent shall be installed in accordance with the requirements of Appendix F (Radon) of this code.

R408.3 Unvented crawl space. Ventilation openings in under-floor spaces specified in Sections R408.1 and R408.2 shall not be required where:

1. Exposed earth is covered with a continuous Class I vapor retarder. Joints of the vapor retarder shall overlap by 6 inches (152 mm) and shall be sealed or taped. The edges of the vapor retarder shall extend at least 6 inches (152 mm) up the stem wall and shall be attached and sealed to the stem wall; and a radon system shall be installed that meets the requirements of Appendix F (Radon) of this code.

2. Continuously operated mechanical exhaust ventilation is provided at a rate equal to 1 cubic foot per minute (0.47 L/s) for each 50 square feet (4.7 m^2) of crawlspace floor area. Exhaust ventilation shall terminate to the exterior.

EXCEPTION: Plenum in existing structures complying with Section M1601.5, if under-floor space is used as a plenum.

[Statutory Authority: Chapter 19.27 RCW. 10-18-036, § 51-51-0408, filed 8/25/10, effective 9/25/10. Statutory Authority: RCW 19.27.031 and 19.27.074. 10-03-098, § 51-51-0408, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 19.27 and 34.05 RCW. 07-01-090, § 51-51-0408, filed 12/19/06, effective 7/1/07.]

WAC 51-51-0502 Section R502—Wood floor framing.

R502.2.2.2 Alternate Deck Ledger Connections. Deck ledger connections not conforming to Table R502.2.2.1 shall be attached with approved fasteners having equivalent withdrawal capacity or be designed in accordance with accepted engineering practice. Girders supporting deck joists shall not be supported on deck ledgers or band joists. Deck ledgers shall not be supported on stone or masonry veneer.

R502.2.2.3 Deck Lateral Load Connections. The lateral load connection required by Section R502.2.2 shall be permitted to be in accordance with Figure R502.2.2.3. Hold-down tension devices shall be installed in not less than two locations per deck, and each device shall have an allowable stress design capacity of not less than 1500 pounds (6672 N).

EXCEPTION: Decks not more than 30 inches above grade at any point may be unattached.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 10-03-098, § 51-51-0502, filed 1/20/10, effective 7/1/10.]

WAC 51-51-0602 Section R602—Wood wall framing.

R602.9 Foundation cripple walls. Foundation cripple walls shall be framed of studs not smaller than the studding above. When exceeding 4 feet (1219 mm) in height, such walls shall be framed of studs having the size required for an additional story.

Cripple walls supporting bearing walls or exterior walls or interior braced wall panels as required in Sections R403.1.2 and R602.10.7.1 with a stud height less than 14 inches (356 mm) shall be sheathed on at least one side with a wood structural panel that is fastened to both the top and bottom plates in accordance with Table R602.3(1), or the cripple walls shall be constructed of solid blocking. Cripple walls shall be supported on continuous footings or foundations.

EXCEPTION: Footings supporting cripple walls used to support interior braced wall panels as required in Sections R403.1.2 and R602.10.7.1 shall be continuous for the required length of the cripple wall and constructed beyond the cripple wall for a minimum distance of 4 inches and a maximum distance of the footing thickness. The footings extension is not required at intersections with other footings.

R602.10.1.2 Length of bracing. The length of bracing along each braced wall line shall be the greater of that required by the design wind speed and braced wall line spacing in accordance with Table R602.10.1.2(1) as adjusted by the factors in the footnotes or the Seismic Design Category and braced wall line length in accordance with Table R602.10.1.2(2) as adjusted by the factors in Table R602.10.1.2(3). Braced wall panel locations shall comply with the requirements of Section R602.10.1.4. Only walls that are parallel to the braced wall line shall be counted toward the bracing requirement of that line, except angled walls shall be counted in accordance with Section R602.10.1.3. In no case shall the minimum total length of bracing in a braced wall line, after all adjustments have been taken, be less than 48 inches (1219 mm) total.

R602.10.1.5 Braced wall line spacing for Seismic Design Categories D_0, D_1 and D_2. Spacing between braced wall lines in each story shall not exceed 25 feet (7620 mm) on center in both the longitudinal and transverse directions.

EXCEPTION: In one-story and two-story buildings, spacing between two adjacent braced wall lines shall not exceed 35 feet (10,668 mm) on center in order to accommodate one single room not exceeding 900 square feet (84 m^2) in each dwelling unit or accessory structure. Spacing between all other braced wall lines shall not exceed 25 feet (7 620 mm). A spacing of 35 feet (10,668 mm) or less shall be permitted between braced wall lines where the length of wall bracing required by Table R602.10.1.2(2) is multiplied by the appropriate adjustment factor from Table R602.10.1.5, the length-to-width ratio for the floor/roof diaphragm does not exceed 3:1, and the top plate lap splice face nailing is twelve 16d nails on each side of the splice.

R602.10.2.3 Redesignation of cripple walls. In any Seismic Design Category, cripple walls are permitted to be redesignated as the first story walls for purposes of determining wall bracing requirements. If the cripple walls are redesignated, the stories above the redesignated story shall be counted as the second and third stories, respectively.

R602.10.7.1 Braced wall panel support for Seismic Design Category D_2. In one-story buildings located in Seismic Design Category D_2, braced wall panels shall be supported on continuous foundations at intervals not exceeding 50 feet (15,240 mm). In two-story buildings located in Seismic Design Category D_2, all braced wall panels shall be supported on continuous foundations.

R602.10.9 Cripple wall bracing. In Seismic Design Categories other than D_2, cripple walls supporting bearing walls or exterior walls or interior braced wall panels as required in R403.1.2 and R602.10.7.1 shall be braced with a length and type of bracing as required for the wall above in accordance with Tables R602.10.1.2(1) and R602.10.1.2(2) with the following modifications for cripple wall bracing:

1. The length of bracing as determined from Tables R602.10.1.2(1) and R602.10.1.2(2) shall be multiplied by a factor of 1.15, and

2. The wall panel spacing shall be decreased to 18 feet (5486 mm) instead of 25 feet (7620 mm).

R602.10.9.1 Cripple wall bracing in Seismic Design Categories D_0, D_1 and D_2. In addition to the requirements of Section R602.10.9, where braced wall lines at interior walls occur without a continuous foundation below, the length of parallel exterior cripple wall bracing shall be 1 1/2 times the length required by Tables R602.10.1.2(1) and R602.10.1.2(2). Where cripple walls braced using Method WSP of Section R602.10.2 cannot provide this additional length, the capacity of the sheathing shall be increased by reducing the spacing of fasteners along the perimeter of each piece of sheathing to 4 inches (102 mm) on center.

In Seismic Design Category D_2, cripple walls supporting bearing walls or exterior walls or interior braced wall panels as required in Sections R403.1.2 and R602.10.7.1 shall be braced in accordance with Tables R602.10.1.2(1) and R602.10.1.2(2).

[Statutory Authority: Chapter 19.27 RCW. 10-18-036, § 51-51-0602, filed 8/25/10, effective 9/25/10. Statutory Authority: RCW 19.27.031 and 19.27.074. 10-03-098, § 51-51-0602, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.190, 19.27.020, and chapters 19.27 and 34.05 RCW. 08-01-102, § 51-51-0602, filed 12/18/07, effective 4/1/08. Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 19.27 and 34.05 RCW. 07-01-090, § 51-51-0602, filed 12/19/06, effective 7/1/07.]

WAC 51-51-0612 Section R612—Exterior windows and glass doors.

R612.6 Testing and labeling. Exterior windows and sliding doors shall be tested by an approved independent laboratory, and bear a label identifying manufacturer, performance characteristics and approved inspection agency to indicated compliance with AAMA/WDMA/CSA 101/I.S.2/A440. Exterior side-hinged doors shall be tested and labeled as conforming to AAMA/WDMA/CSA 101/I.S.2/A440 or comply with Section R612.6.

EXCEPTIONS:
1. Decorative glazed openings.
2. Custom exterior windows and doors manufactured by a small business shall be exempt from all testing requirements in Section R612 of the International Residential Code provided they meet the applicable provisions of Chapter 24 of the International Building Code.

[Statutory Authority: Chapter 19.27 RCW. 10-18-036, § 51-51-0612, filed 8/25/10, effective 9/25/10. Statutory Authority: RCW 19.27.031 and 19.27.074. 10-03-098, amended and recodified as § 51-51-0612, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 19.27 and 34.05 RCW. 07-01-090, § 51-51-0613, filed 12/19/06, effective 7/1/07.]

WAC 51-51-0702 Section R702—Interior covering.

R702.5 Other finishes. Wood veneer paneling and hardboard paneling shall be placed on wood or cold-formed steel framing spaced not more than 16 inches (406 mm) on center. Wood veneer and hardboard paneling less than 1/4-inch (6 mm) nominal thickness shall not have less than a 3/8-inch (10 mm) gypsum board backer. Wood veneer paneling not less than 1/4-inch (6 mm) nominal thickness shall conform to ANSI/HPVA HP-1. Hardboard paneling shall conform to ANSI/AHA A135.5. All structural panel components within the conditioned space such as plywood, particle board, wafer board and oriented strand board shall be identified as "EXPOSURE 1," "EXTERIOR" or "HUD-APPROVED."

[Statutory Authority: RCW 19.27.031 and 19.27.074. 10-03-098, § 51-51-0702, filed 1/20/10, effective 7/1/10.]

WAC 51-51-0703 Section R703—Exterior covering.

R703.1 General. Exterior walls shall provide the building with a weather-resistant exterior wall envelope. The exterior wall envelope shall include flashing as described in Section R703.8.

R703.1.1 Water resistance. The exterior wall envelope shall be designed and constructed in a manner that prevents the accumulation of water within the wall assembly by providing a water-resistant barrier behind the exterior veneer as required by Section R703.2 and a means of draining water that enters the assembly to the exterior. Protection against condensation in the exterior wall assembly shall be provided in accordance with Section 601.3 of this code.

EXCEPTIONS:
1. A weather-resistant exterior wall envelope shall not be required over concrete or masonry walls designed in accordance with Chapter 6 and flashed according to Section R703.7 or R703.8.
2. Compliance with the requirements for a means of drainage, and the requirements of Section R703.2 and R703.8, shall not be required for an exterior wall envelope that has been demonstrated to resist wind-driven rain through testing of the exterior wall envelope, including joints, penetrations and intersections with dissimilar materials, in accordance with ASTM E 331 under the following conditions:
2.1. Exterior wall envelope test assemblies shall include at least one opening, one control joint, one wall/eave interface and one wall sill. All tested openings and penetrations shall be representative of the intended end-use configuration.
2.2. Exterior wall envelope test assemblies shall be at least 4 feet (1219 mm) by 8 feet (2438 mm) in size.
2.3. Exterior wall assemblies shall be tested at a minimum differential pressure of 6.24 pounds per square foot (299Pa).
2.4. Exterior wall envelope assemblies shall be subjected to a minimum test exposure duration of 2 hours. The exterior wall envelope design shall be considered to resist wind-driven rain where the results of testing indicate that water did not penetrate: Control joints in the exterior wall envelope; joints at the perimeter of opening penetration; or intersections of terminations with dissimilar materials.
3. The requirement for a means of drainage shall not be construed to mean an air space cavity under the exterior cladding for an exterior wall clad with panel

or lapped siding made of plywood, engineered wood, hardboard, or fiber cement. A water-resistive barrier as required by Section R703.2 and Table R703.4 will be required on exterior walls.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 10-03-098, § 51-51-0703, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.190, 19.27.020, and chapters 19.27 and 34.05 RCW. 08-01-102, § 51-51-0703, filed 12/18/07, effective 4/1/08.]

WAC 51-51-0806 Section R806—Roof ventilation.

R806.4 Unvented attic assemblies. Unvented attic assemblies (spaces between the ceiling joists of the top story and the roof rafters) shall be permitted if all of the following conditions are met:

1. The unvented attic space is completely contained within the building thermal envelope.

2. No interior vapor retarders are installed on the ceiling side (attic floor) of the unvented attic assembly.

3. Where wood shingles or shakes are used, a minimum 1/4-inch (6 mm) vented air space separates the shingles or shakes and the roofing underlayment above the structural sheathing.

4. Any air-impermeable insulation shall be a vapor retarder, or shall have a vapor retarder coating or covering in direct contact with the underside of the insulation.

5. Either items a, b or c below shall be met, depending on the air permeability of the insulation directly under the structural roof sheathing.

a. Air-impermeable insulation only. Insulation shall be applied in direct contact to the underside of the structural roof sheathing.

b. Air-permeable insulation only. In addition to the air-permeable insulation installed directly below the structural sheathing, rigid board or sheet insulation shall be installed directly above the structural roof sheathing as specified per Washington climate zone for condensation control.

i. Climate Zone #1 - R-10 minimum rigid board or air-impermeable insulation R-value.

ii. Climate Zone #2 - R-25 minimum rigid board or air-impermeable insulation R-value.

c. Air-impermeable and air-permeable insulation. The air-impermeable insulation shall be applied in direct contact to the underside of the structural roof sheathing as specified per Washington climate zone for condensation control. The air-permeable insulation shall be installed directly under the air-impermeable insulation.

i. Climate Zone #1 - R-10 minimum rigid board or air-impermeable insulation R-value.

ii. Climate Zone #2 - R-25 minimum rigid board or air-impermeable insulation R-value.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 10-03-098, § 51-51-0806, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 19.27 and 34.05 RCW. 07-01-090, § 51-51-0806, filed 12/19/06, effective 7/1/07.]

WAC 51-51-0903 Section R903—Weather protection.

R903.4.1 Overflow drains and scuppers. Where roof drains are required, overflow drains having the same size as the roof drains shall be installed with the inlet flow line located 2 inches (51 mm) above the low point of the roof, or overflow scuppers having three times the size of the roof drains and having a minimum opening height of 4 inches (102 mm) shall be installed in the adjacent parapet walls with the inlet flow located 2 inches (51 mm) above the low point of the roof served. The installation and sizing of overflow drains, leaders and conductors shall comply with the plumbing code. Overflow drains shall discharge to an approved location.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 10-03-098, § 51-51-0903, filed 1/20/10, effective 7/1/10.]

WAC 51-51-1001 Section R1001—Masonry fireplaces.

R1001.7.1 Damper. Masonry fireplaces shall be equipped with a ferrous metal damper located at least 8 inches (203 mm) above the top of the fireplace opening. Dampers shall be installed in the fireplace or the chimney venting the fireplace, and shall be operable from the room containing the fireplace.

Fireplaces shall be provided with each of the following:

1. Tightly fitting flue dampers, operated by a readily accessible manual or approved automatic control.

EXCEPTION: Fireplaces with gas logs shall be installed in accordance with the International Mechanical Code Section 901, except that the standards for liquefied petroleum gas installations shall be NFPA 58 (Liquefied Petroleum Gas Code) and NFPA 54 (National Fuel Gas Code).

2. An outside source for combustion air ducted into the firebox. The duct shall be at least 6 square inches, and shall be provided with an operable outside air duct damper.

EXCEPTION: Washington certified fireplaces shall be installed with the combustion air systems necessary for their safe and efficient combustion and specified by the manufacturer in accordance with the Washington State Building Standard 31-2 (WAC 51-50-31200) and IBC Section 2114 (WAC 51-50-2114).

3. Site built fireplaces shall have tight fitting glass or metal doors, or a flue draft induction fan or as approved for minimizing back-drafting. Factory built fireplaces shall use doors listed for the installed appliance.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 10-03-098, § 51-51-1001, filed 1/20/10, effective 7/1/10.]

WAC 51-51-1006 Section R1006—Exterior air supply.

R1006.2 Solid fuel burning appliances and fireplaces. Solid fuel burning appliances and fireplaces shall be provided with tight fitting metal or ceramic glass doors, and:

1. A source from outside the structure of primary combustion air, connected to the appliance as per manufacturer's specification. The air inlet shall originate at a point below the fire box. The duct shall be 4 inches or greater in diameter, not exceed 20 feet in length, and be installed as per manufacturer's instructions; or

2. The appliance and manufacturer's recommended combustion air supply, as an installed unit, shall be certified by an independent testing laboratory to have passed Test No. 11-Negative Pressure Test, Section 12.3, of ULC S627-M1984 "Space Heaters for Use with Solid Fuels," modified as follows:

Negative pressure of 8 Pascal shall be initially established with the chamber sealed and the air supply, if not directly connected to the appliance, closed off.

The air supply if not directly connected to the appliance, shall then be opened.

The maximum allowable air exchange rate from chamber leakage and intentional air supply for the unit (appliance with combustion air supply) in the test chamber is 3.5 air changes per hour, or 28 cfm (cubic feet of air per minute), whichever is less.

EXCEPTION: Combustion air may be supplied to the room in which the solid fuel burning appliance is located in lieu of direct ducting, provided that one of the following conditions is met:
1. The solid fuel burning appliance is part of a central heating plant and installed in an unconditioned space in conformance with the International Mechanical Code; or
2. The solid fuel burning appliance is installed in existing construction directly on a concrete floor or surrounded by masonry materials as in a fireplace. The combustion air terminus shall be located as close to the solid fuel burning appliance as possible and shall be provided with a barometric damper or equivalent. The combustion air source shall be specified by the manufacturer or no less than 4 inches in diameter or the equivalent in area or as approved.

R1006.1.1 Factory built fireplaces. This section is not adopted.

R1006.1.2 Masonry fireplaces. This section is not adopted.

R1006.2 Exterior air intake. This section is not adopted.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 10-03-098, § 51-51-1006, filed 1/20/10, effective 7/1/10.]

WAC 51-51-1302 Section M1302—General mechanical system requirements.

M1302.2 Construction Documents. The plans and specifications shall show in sufficient detail pertinent data and features of the materials, equipment and systems as herein governed, including, but not limited to: Design criteria, size and type of apparatus and equipment, systems and equipment controls, provisions for combustion air to fuel burning appliances, and other pertinent data to indicate conformance with the requirements of this code.

M1302.3 Testing. At the discretion of the building official, flow testing may be required to verify that the mechanical system(s) satisfies the requirements of this code. Flow testing may be performed using flow hoods measuring at the intake or exhaust points of the system, in-line pitot tube, or pitot-traverse type measurement systems in the duct, short term tracer gas measurements, or other means approved by the building official.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 10-03-098, § 51-51-1302, filed 1/20/10, effective 7/1/10.]

WAC 51-51-1415 Section M1415—Masonry heaters.

M1415.1 General. Masonry heaters shall be approved by the department of ecology and shall contain both of the following:

1. Primary combustion air ducted from the outside of the structure to the appliance.

2. Tight fitting ceramic glass or metal doors. Flue damper, when provided, shall have an external control and when in the closed position shall have a net free area of not less than 5% of the flue cross sectional area.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 10-03-098, § 51-51-1415, filed 1/20/10, effective 7/1/10.]

WAC 51-51-1501 Reserved.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 10-03-098, § 51-51-1501, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.190, 19.27.020, and chapters 19.27 and 34.05 RCW. 08-01-102, § 51-51-1501, filed 12/18/07, effective 4/1/08.]

WAC 51-51-1507 Section M1507—Mechanical ventilation.

M1507.1 General. Source specific exhaust ventilation is required in each kitchen, bathroom, water closet, laundry room, indoor swimming pool, spa, and other rooms where water vapor or cooking odor is produced. The minimum source specific ventilation effective exhaust capacity shall not be less than levels specified in Table M1507.3.

M1507.3.1 Source Specific Exhaust Fans. Exhaust fans providing source specific ventilation shall have a minimum fan flow rating not less than 50 cfm at 0.25 inches water gauge for bathrooms, laundries, or similar rooms and 100 cfm at 0.25 inches water gauge for kitchens. Manufacturers' fan flow ratings shall be determined as per HVI 916 (April 1995) or AMCA 210.

EXCEPTION: Where a range hood or down draft exhaust fan is used to satisfy the source specific ventilation requirements for kitchens, the range hood or down draft exhaust shall not be less than 100 cfm at 0.10 inches water gauge.

M1507.3.2 Source Specific Ventilation Controls. Source specific ventilation systems shall be controlled by manual switches, dehumidistats, timers, or other approved means. Source specific ventilation system controls shall be readily accessible.

M1507.3.3 Source Specific Ventilation Ducts. Source specific ventilation ducts shall terminate outside the building. Exhaust ducts shall be equipped with back-draft dampers. All exhaust ducts in unconditioned spaces shall be insulated to a minimum of R-4. Terminal elements shall have at least the equivalent net free area of the duct work. Terminal elements for exhaust fan duct systems shall be screened or otherwise protected from entry by leaves or other material. Minimum 50% net free area shall meet the requirements of R303.5.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 10-03-098, § 51-51-1507, filed 1/20/10, effective 7/1/10.]

WAC 51-51-1508 Section M1508—Whole house ventilation.

M1508.1 General. This section establishes minimum prescriptive design requirements for whole house ventilation systems. Each dwelling unit or guest room shall be equipped with a ventilation system complying with Section M1508.4, M1508.5, M1508.6 or M1508.7. Compliance is also permitted to be demonstrated through compliance with the International Mechanical Code.

M1508.1.1 Operating Instructions. Installers shall provide the manufacturer's installation, operating instructions, and a whole house ventilation system operation description.

M1508.2 Continuously Operating Exhaust Ventilation Systems. Continuously operating exhaust ventilation systems shall provide the minimum flow rates specified in Table M1508.2.

TABLE M1508.2
MINIMUM VENTILATION RATES
(Continuously operating systems)

	Bedrooms				
	0-1	**2-3**	**4-5**	**6-7**	**>7**
<1500	30	45	60	75	90
1501-3000	45	60	75	90	105
3001-4500	60	75	90	105	120
4501-6000	75	90	105	120	135
6001-7500	90	105	120	135	150
>7500	105	120	135	150	165

M1508.3 Intermittently Operating Ventilation Systems. The delivered ventilation rate for intermittently operating ventilation systems shall be the combination of its delivered capacity from Table M1508.2, and its ventilation effectiveness and daily fractional operation time from Table M1508.3.

$$Q_f = Q_r/(\in f)$$

Where:

Q_f	=	Fan flow rate
Q_r	=	Ventilation air requirement (from Table M1508.2)
	=	Ventilation effectiveness (from Table M1508.3)
f	=	Fractional operation time

TABLE M1508.3
VENTILATION EFFECTIVENESS FOR INTERMITTENT FANS

Daily Fractional Operation Time, f	Ventilation Effectiveness, ∈
$f \le 35\%$	0.33
$35\% \le f < 60\%$	0.50
$60\% \le f < 80\%$	0.75
$80\% \le f$	1.0

For systems designed to operate at least once every three hours, ventilation effectiveness can be 1.0.

M1508.4 Intermittent Whole House Ventilation Using Exhaust Fans. This section establishes minimum prescriptive requirements for intermittent whole house ventilation systems using exhaust fans. A system which meets all the requirements of this section shall be deemed to satisfy the requirements for a whole house ventilation system.

M1508.4.1 Whole House Ventilation Fans. Exhaust fans providing whole house ventilation shall have a flow rating at 0.25 inches water gauge as specified in Table M1503.2 [M1508.2]. Manufacturers' fan flow ratings shall be determined according to HVI 916 (April 1995) or AMCA 210.

M1508.4.2 Fan Noise. Whole house fans located 4 feet or less from the interior grille shall have a sone rating of 1.0 or less measured at 0.1 inches water gauge. Manufacturer's noise ratings shall be determined as per HVI 915 (October 1995). Remotely mounted fans shall be acoustically isolated from the structural elements of the building and from attached duct work using insulated flexible duct or other approved material.

M1508.4.3 Fan Controls. The whole house ventilation fan shall be controlled by a 24-hour clock timer with the capability of continuous operation, manual and automatic control. The 24-hour timer shall be readily accessible. The 24-hour timer shall be capable of operating the whole house ventilation fan without energizing other energy-consuming appliances. At the time of final inspection, the automatic control timer shall be set to operate the whole house fan for at least 8 hours a day. A label shall be affixed to the control that reads "Whole House Ventilation (see operating instructions)."

M1508.4.4 Exhaust Ducts. All exhaust ducts shall terminate outside the building. Exhaust ducts shall be equipped with back-draft dampers. All exhaust ducts in unconditioned spaces shall be insulated to a minimum of R-4.

M1508.4.5 Outdoor Air Inlets. Outdoor air shall be distributed to each habitable room by individual outdoor air inlets. Where outdoor air supplies are separated from exhaust points by doors, provisions shall be made to ensure air flow by installation of distribution ducts, undercutting doors, installation of grilles, transoms, or similar means. Doors shall be undercut to a minimum of 1/2 inch above the surface of the finish floor covering.

Individual room outdoor air inlets shall:

1. Have controllable and secure openings;

2. Be sleeved or otherwise designed so as not to compromise the thermal properties of the wall or window in which they are placed;

3. Provide not less than 4 square inches of net free area of opening for each habitable space. Any inlet or combination of inlets which provide 10 cfm at 10 Pascals as determined by the Home Ventilating Institute Air Flow Test Standard (HVI 901 November 1996) are deemed equivalent to 4 square inches net free area.

Inlets shall be screened or otherwise protected from entry by leaves or other material. Outdoor air inlets shall be located so as not to take air from the following areas:

1. Closer than 10 feet from an appliance vent outlet, unless such vent outlet is 3 feet above the outdoor air inlet.

2. Where it will pick up objectionable odors, fumes or flammable vapors.

3. A hazardous or unsanitary location.

4. A room or space having any fuel-burning appliances therein.

5. Closer than 10 feet from a vent opening of a plumbing drainage system unless the vent opening is at least 3 feet above the air inlet.

6. Attic, crawl spaces, or garages.

M1508.5 Intermittent Whole House Ventilation Integrated With a Forced-Air System. This section establishes minimum prescriptive requirements for intermittent whole house ventilation systems integrated with forced-air ventilation systems. A system which meets all the requirements of

this section shall be deemed to satisfy the requirements for a whole house ventilation system.

M1508.5.1 Integrated Whole House Ventilation Systems. Integrated whole house ventilation systems shall provide outdoor air at the rate calculated using Section M1508.3. Integrated forced-air ventilation systems shall distribute outdoor air to each habitable room through the forced-air system ducts. Integrated forced-air ventilation systems shall have an outdoor air inlet duct connecting a terminal element on the outside of the building to the return air plenum of the forced-air system, at a point within 4 feet upstream of the air handler. The outdoor air inlet duct connection to the return air stream shall be located upstream of the forced-air system blower and shall not be connected directly into a furnace cabinet to prevent thermal shock to the heat exchanger. The system will be equipped with a motorized damper connected to the automatic ventilation control as specified in Section M1508.5.2. The required flow rate shall be verified by field testing with a flow hood or a flow measuring station.

M1508.5.2 Ventilation Controls. The whole house ventilation system shall be controlled by a 24-hour clock timer with the capability of continuous operation, manual and automatic control. This control will control the forced air system blower and the automatic damper. The 24-hour timer shall be readily accessible. The 24-hour timer shall be capable of operating the whole house ventilation system without energizing other energy-consuming appliances. At the time of final inspection, the automatic control timer shall be set to operate the whole house system for at least 8 hours a day. A label shall be affixed to the control that reads "Whole House Ventilation (see operating instructions)."

M1508.5.3 Ventilation Duct Insulation. All supply ducts in the conditioned space shall be insulated to a minimum of R-4.

M1508.5.4 Outdoor Air Inlets. Inlets shall be screened or otherwise protected from entry by leaves or other material. Outdoor air inlets shall be located so as not to take air from the following areas:

1. Closer than 10 feet from an appliance vent outlet, unless such vent outlet is 3 feet above the outdoor air inlet.

2. Where it will pick up objectionable odors, fumes or flammable vapors.

3. A hazardous or unsanitary location.

4. A room or space having any fuel-burning appliances therein.

5. Closer than 10 feet from a vent opening of a plumbing drainage system unless the vent opening is at least 3 feet above the air inlet.

6. Attic, crawl spaces, or garages.

M1508.6. Intermittent Whole House Ventilation Using a Supply Fan. This section establishes minimum prescriptive requirements for intermittent whole house ventilation systems using an inline supply fan. A system which meets all the requirements of this section shall be deemed to satisfy the requirements for a whole house ventilation system.

M1508.6.1 Outdoor Air. Supply fan ventilation systems shall distribute outdoor air to each habitable room through the forced-air system ducts or through dedicated ducts to each habitable room. Supply fans shall have the capacity to provide the amount of outdoor air specified in Table M1508.2 at 0.40 inches water gauge as per HVI 916 (April 1995). The outdoor air must be filtered before it is delivered to habitable rooms. The filter may be located at the intake device, in line with the fan, or, in the case of a connection to the return plenum of the air handler, using the furnace filter. An outdoor air inlet shall be connected to either the supply or return air stream.

M1508.6.2 Ducts. An outdoor air inlet duct connection to the supply air stream shall be located downstream of the forced-air system blower. An outdoor air inlet duct connection to the return air stream shall be located at least 4 feet upstream of the forced-air system blower and its filter. Neither type of duct shall be connected directly into a furnace cabinet to prevent thermal shock to the heat exchanger. The outdoor air inlet duct shall be prescriptively sized in accordance with Table M1508.6.2. The terminal element on the outside of the building shall be sized 2 inches in diameter larger than the outdoor air inlet duct.

TABLE M1508.6.2
PRESCRIPTIVE SUPPLY FAN DUCT SIZING

Supply Fan Tested cfm at 0.40" wg		
Specified Volume from Table M1508.2	**Minimum Smooth Duct Diameter**	**Minimum Flexible Duct Diameter**
50 - 90 cfm	4 inch	5 inch
90 - 150 cfm	5 inch	6 inch
150 - 250 cfm	6 inch	7 inch
250 - 400 cfm	7 inch	8 inch

M1508.6.3 Dampers. The system shall be equipped with a back-draft damper and one of the following:

1. A calibrated manual volume damper installed and set to meet the measured flow rates specified in Table M1508.2 by field testing with a pressure gauge and/or following manufacturer's installation instructions; or

2. A manual volume damper installed and set to meet the measured flow rates specified in Table M1508.2 by field testing with a flow hood or a flow measuring station; or

3. An automatic flow-regulating device sized to the specified flow rates in Table M1508.2 which provides constant flow over a pressure range of 0.20 to 0.60 inches water gauge.

M1508.6.4 Ventilation Controls. The whole house ventilation system shall be controlled by a 24-hour clock timer with the capability of continuous operation, manual and automatic control. This will control the inline supply fan. The 24-hour timer shall be readily accessible. The 24-hour timer shall be capable of operating the whole house ventilation system without energizing other energy-consuming appliances. At the time of final inspection, the automatic control timer shall be set to operate the whole house system for at least 8 hours a day. A label shall be affixed to the control that reads "Whole House Ventilation (see operating instructions)."

M1508.6.5 Ventilation Duct Insulation. All supply ducts in the conditioned space shall be insulated to a minimum of R-4.

M1508.6.6 Outdoor Air Inlets. Inlets shall be screened or otherwise protected from entry by leaves or other material.

Outdoor air inlets shall be located so as not to take air from the following areas:

1. Closer than 10 feet from an appliance vent outlet, unless such vent outlet is 3 feet above the outdoor air inlet.

2. Where it will pick up objectionable odors, fumes or flammable vapors.

3. A hazardous or unsanitary location.

4. A room or space having any fuel-burning appliances therein.

5. Closer than 10 feet from a vent opening of a plumbing drainage system unless the vent opening is at least 3 feet above the air inlet.

6. Attic, crawl spaces, or garages.

M1508.7 Intermittent Whole House Ventilation Using a Heat Recovery Ventilation System. This section establishes minimum prescriptive requirements for intermittent whole house ventilation using a heat recovery ventilation system.

M1508.7.1 Heat Recovery Ventilation Systems. All duct work in heat recovery systems shall be sized and installed per the manufacturer's instructions. System minimum flow rating shall be not less than that specified in Table M1508.2. Heat recovery ventilation systems shall have a filter on the upstream side of the heat exchanger in both the intake and exhaust airstreams with a minimum efficiency ratings value (MERV) of 6.

M1508.7.2 Ventilation Controls. The whole house ventilation system shall be controlled by a 24-hour clock timer with the capability of continuous operation, manual and automatic control. This control will control the inline supply fan. The 24-hour timer shall be readily accessible. The 24-hour timer shall be capable of operating the whole house ventilation system without energizing other energy-consuming appliances. At the time of final inspection, the automatic control timer shall be set to operate the whole house system for at least 8 hours a day. A label shall be affixed to the control that reads "Whole House Ventilation (see operating instructions)."

M1508.7.3 Ventilation Duct Insulation. All supply ducts in the conditioned space installed upstream of the heat exchanger shall be insulated to a minimum of R-4.

M1508.7.4 Outdoor Air Inlets. Inlets shall be screened or otherwise protected from entry by leaves or other material. Outdoor air inlets shall be located so as not to take air from the following areas:

1. Closer than 10 feet from an appliance vent outlet, unless such vent outlet is 3 feet above the outdoor air inlet.

2. Where it will pick up objectionable odors, fumes or flammable vapors.

3. A hazardous or unsanitary location.

4. A room or space having any fuel-burning appliances therein.

5. Closer than 10 feet from a vent opening of a plumbing drainage system unless the vent opening is at least 3 feet above the air inlet.

6. Attic, crawl spaces, or garages.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 10-03-098, § 51-51-1508, filed 1/20/10, effective 7/1/10.]

WAC 51-51-1600 Chapter 16—Duct systems.

M1601.1.1 Above-ground duct systems. Above-ground duct systems shall conform to the following:

1. Equipment connected to duct systems shall be designed to limit discharge air temperature to a maximum of 250°F (121°C).

2. Factory-made air ducts shall be constructed of Class 0 or Class 1 materials as designated in Table M1601.1.1(1).

3. Fibrous duct construction shall conform to the SMACNA Fibrous Glass Duct Construction Standards or NAIMA Fibrous Glass Duct Construction Standards.

4. Minimum thickness of metal duct material shall be as listed in Table M1601.1.1(2). Galvanized steel shall conform to ASTM A 653.

5. Use of gypsum products to construct return air ducts or plenums is permitted, provided that the air temperature does not exceed 125°F (52°C) and exposed surfaces are not subject to condensation.

6. Duct systems shall be constructed of materials having a flame spread index not greater than 200.

7. Stud wall cavities and the spaces between solid floor joists shall not be used as a duct or an air plenum in new construction. For existing systems, stud wall cavities and the spaces between solid floor joists to be used as air plenums shall comply with the following:

7.1. These cavities or spaces shall not be used as a plenum for supply air.

7.2. These cavities or spaces shall not be part of a required fire-resistance-rated assembly.

7.3. Stud wall cavities shall not convey air from more than one floor level.

7.4. Stud wall cavities and joist-space plenums shall be isolated from adjacent concealed spaces by tight-fitting fire blocking in accordance with Section R602.8.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 10-03-098, § 51-51-1600, filed 1/20/10, effective 7/1/10.]

WAC 51-51-1700 Chapter 17—Combustion air.

M1701.1 Scope. Solid-fuel-burning appliances shall be provided with combustion air in accordance with the appliance manufacturer's installation instructions. Oil-fired appliances shall be provided with combustion air in accordance with NFPA 31. The methods of providing combustion air in this chapter do not apply to fireplaces, fireplace stoves and direct-vent appliances. The requirements for combustion and dilution air for gas-fired appliances shall be in accordance with Chapter 24.

Fireplaces shall comply with Section 1001.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 10-03-098, § 51-51-1700, filed 1/20/10, effective 7/1/10.]

WAC 51-51-2439 Reserved.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 10-03-098, § 51-51-2439, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.190, 19.27.020, and chapters 19.27 and 34.05 RCW. 08-01-102, § 51-51-2439, filed 12/18/07, effective 4/1/08.]

WAC 51-51-4400 Chapter 44—Referenced standards.

Washington State Building Code Standard 31-2
STANDARD TEST METHOD FOR PARTICULATE EMISSIONS FROM FIREPLACES

See Section R1004.1, *International Residential Code* Standard is located in *International Building Code*, Chapter 35

[Statutory Authority: RCW 19.27.031 and 19.27.074. 10-03-098, amended and recodified as § 51-51-4400, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 19.27 and 34.05 RCW. 07-01-090, § 51-51-4300, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-109, § 51-51-4300, filed 12/17/03, effective 7/1/04.]

WAC 51-51-60105 Appendix R—Dwelling unit fire sprinkler systems.

AR105.1 General. Where installed, residential fire sprinkler systems, or portions thereof, shall be in accordance with NFPA 13D or Appendix R, which shall be considered equivalent to NFPA 13D. Appendix R shall apply to stand-alone and multipurpose wet-pipe sprinkler systems that do not include the use of antifreeze. A multipurpose fire sprinkler system shall supply domestic water to both fire sprinklers and plumbing fixtures. A stand-alone sprinkler system shall be separate and independent from the water distribution system.

AR105.1.1 Required sprinkler locations. Sprinklers shall be installed to protect all areas of a dwelling unit.

EXCEPTIONS:
1. Attics, crawl spaces and normally unoccupied concealed spaces that do not contain fuel-fired appliances do not require sprinklers. In attics, crawl spaces and normally unoccupied concealed spaces that contain fuel-fired equipment, a sprinkler shall be installed above the equipment; however, sprinklers shall not be required in the remainder of the space.
2. Clothes closets, linen closets and pantries not exceeding 24 square feet (2.2 m^2) in area, with the smallest dimension not greater than 3 feet (915 mm) and having wall and ceiling surfaces of gypsum board.
3. Bathrooms not more than 55 square feet (5.1 m^2) in area.
4. Garages; carports; exterior porches; unheated entry areas, such as mud rooms, that are adjacent to an exterior door; and similar areas.

AR105.2 Sprinklers. Sprinklers shall be new listed residential sprinklers and shall be installed in accordance with the sprinkler manufacturer's installation instructions.

AR105.2.1 Temperature rating and separation from heat sources. Except as provided for in Section AR105.2.2, sprinklers shall have a temperature rating of not less than 135°F (57°C) and not more than 170°F (77°C). Sprinklers shall be separated from heat sources as required by the sprinkler manufacturer's installation instructions.

AR105.2.2 Intermediate temperature sprinklers. Sprinklers shall have an intermediate temperature rating not less than 175°F (79°C) and not more than 225°F (107°C) where installed in the following locations:

1. Directly under skylights, where the sprinkler is exposed to direct sunlight.
2. In attics.
3. In concealed spaces located directly beneath a roof.
4. Within the distance to a heat source as specified in Table AR105.2.2.

AR105.2.3 Freezing areas. Piping shall be protected from freezing. Where sprinklers are required in areas that are subject to freezing, dry-side-wall or dry-pendent sprinklers extending from a nonfreezing area into a freezing area shall be installed.

TABLE AR105.2.2
LOCATIONS WHERE INTERMEDIATE TEMPERATURE SPRINKLERS ARE REQUIRED

HEAT SOURCE	RANGE OF DISTANCE FROM HEAT SOURCE WITHIN WHICH INTERMEDIATE TEMPERATURE SPRINKLERS ARE REQUIRED [a,b] (inches)
Fireplace, side of open or recessed fireplace	12 to 36
Fireplace, front of recessed fireplace	36 to 60
Coal and wood burning stove	12 to 42
Kitchen range top	9 to 18
Oven	9 to 18
Vent connector or chimney connector	9 to 18
Heating duct, not insulated	9 to 18
Hot water pipe, not insulated	6 to 12
Side of ceiling or wall warm air register	12 to 24
Front of wall mounted warm air register	18 to 36
Water heater, furnace or boiler	3 to 6
Luminaire up to 250 watts	3 to 6
Luminaire 250 watts up to 499 watts	6 to 12

For IS: 1 inch = 25.4 mm.
a. Sprinklers shall not be located at distances less than the minimum table distance unless the sprinkler listing allows a lesser distance.
b. Distances shall be measured in a straight line from the nearest edge of the heat source to the nearest edge of the sprinkler.

AR105.2.4 Sprinkler coverage. Sprinkler coverage requirements and sprinkler obstruction requirements shall be in accordance with Sections AR105.2.4.1 and AR105.2.4.2.

AR105.2.4.1 Coverage area limit. The area of coverage of a single sprinkler shall not exceed 400 square feet (37 m^2) and shall be based on the sprinkler listing and the sprinkler manufacturer's installation instructions.

AR105.2.4.2 Obstructions to coverage. Sprinkler discharge shall not be blocked by obstructions unless additional sprinklers are installed to protect the obstructed area. Sprinkler separation from obstructions shall comply with the minimum distances specified in the sprinkler manufacturer's instructions.

AR105.2.4.2.1 Additional requirements for pendent sprinklers. Pendent sprinklers within 3 feet (915 mm) of the center of a ceiling fan, surface-mounted ceiling luminaire or similar object shall be considered to be obstructed, and additional sprinklers shall be installed.

AR105.2.4.2.2 Additional requirements for sidewall sprinklers. Sidewall sprinklers within 5 feet (1524 mm) of the center of a ceiling fan, surface-mounted ceiling luminaire or similar object shall be considered to be obstructed, and additional sprinklers shall be installed.

AR105.2.5 Sprinkler installation on systems assembled with solvent cement. The solvent cementing of threaded adapter fittings shall be completed and threaded adapters for sprinklers shall be verified as being clear of excess cement prior to the installation of sprinklers on systems assembled with solvent cement.

AR105.2.6 Sprinkler modifications prohibited. Painting, caulking or modifying of sprinklers shall be prohibited. Sprinklers that have been painted, caulked, modified or damaged shall be replaced with new sprinklers.

AR105.3 Sprinkler piping system. Sprinkler piping shall be supported in accordance with the requirements for cold water distribution piping. Sprinkler piping shall comply with all requirements for cold water distribution piping. For multipurpose piping systems, the sprinkler piping shall connect to and be a part of the cold water distribution piping system.

AR105.3.1 Nonmetallic pipe and tubing. Nonmetallic pipe and tubing, such as CPVC and PEX, shall be listed for use in residential fire sprinkler systems.

AR105.3.1.1 Nonmetallic pipe protection. Nonmetallic pipe and tubing systems shall be protected from exposure to the living space by a layer of not less than 3/8-inch (9.5 mm) thick gypsum wallboard, 1/2-inch thick plywood (13 mm), or other material having a 15-minute fire rating.

EXCEPTIONS:
1. Pipe protection shall not be required in areas that do not require protection with sprinklers as specified in Section AR105.1.1.
2. Pipe protection shall not be required where exposed piping is permitted by the pipe listing.

AR105.3.2 Shutoff valves prohibited. With the exception of shutoff valves for the entire water distribution system, valves shall not be installed in any location where the valve would isolate piping serving one or more sprinklers.

AR105.3.3 Single dwelling limit. Piping beyond the service valve located at the beginning of the water distribution system shall not serve more than one dwelling.

AR105.3.4 Drain. A means to drain the sprinkler system shall be provided on the system side of the water distribution shutoff valve.

AR105.4 Determining system design flow. The flow for sizing the sprinkler piping system shall be based on the flow rating of each sprinkler in accordance with Section AR105.4.1 and the calculation in accordance with Section AR105.4.2.

AR105.4.1 Determining required flow rate for each sprinkler. The minimum required flow for each sprinkler shall be determined using the sprinkler manufacturer's published data for the specific sprinkler model based on all of the following:

1. The area of coverage.
2. The ceiling configuration.
3. The temperature rating.
4. Any additional conditions specified by the sprinkler manufacturer.

AR105.4.2 System design flow rate. The design flow rate for the system shall be based on the following:

1. The design flow rate for a room having only one sprinkler shall be the flow rate required for that sprinkler, as determined by Section AR105.4.1.

2. The design flow rate for a room having two or more sprinklers shall be determined by identifying the sprinkler in that room with the highest required flow rate, based on Section AR105.4.1, and multiplying that flow rate by 2.

3. Where the sprinkler manufacturer specifies different criteria for ceiling configurations that are not smooth, flat and horizontal, the required flow rate for that room shall comply with the sprinkler manufacturer's instructions.

4. The design flow rate for the sprinkler system shall be the flow required by the room with the largest flow rate, based on Items 1, 2 and 3.

5. For the purpose of this section, it shall be permissible to reduce the design flow rate for a room by subdividing the space into two or more rooms, where each room is evaluated separately with respect to the required design flow rate. Each room shall be bounded by walls and a ceiling. Openings in walls shall have a lintel not less than 8 inches (203 mm) in depth and each lintel shall form a solid barrier between the ceiling and the top of the opening.

AR105.5 Water supply. The water supply shall provide not less than the required design flow rate for sprinklers in accordance with Section AR105.4.2 at a pressure not less than that used to comply with Section AR105.6.

AR105.5.1 Water supply from individual sources. Where a dwelling unit water supply is from a tank system, a private well system or a combination of these, the available water supply shall be based on the minimum pressure control setting for the pump.

AR105.5.2 Required capacity. The water supply shall have the capacity to provide the required design flow rate for sprinklers for a period of time as follows:

1. 7 minutes for dwelling units one story in height and less than 2,000 square feet (186 m^2) in area.

2. 10 minutes for dwelling units two or more stories in height or equal to or greater than 2,000 square feet (186 m^2) in area.

Where a well system, a water supply tank system or a combination thereof is used, any combination of well capacity and tank storage shall be permitted to meet the capacity requirement.

AR105.6 Pipe sizing. The piping to sprinklers shall be sized for the flow required by Section AR105.4.2. The flow required to supply the plumbing fixtures shall not be required to be added to the sprinkler design flow.

AR105.6.1 Method of sizing pipe. Piping supplying sprinklers shall be sized using the prescriptive method in Section AR105.6.2 or by hydraulic calculation in accordance with NFPA 13D. The minimum pipe size from the water supply source to any sprinkler shall be 3/4 inch (19 mm) nominal. Threaded adapter fittings at the point where sprinklers are attached to the piping shall be a minimum of 1/2 inch (13 mm) nominal.

AR105.6.2 Prescriptive pipe sizing method. Pipe shall be sized by determining the available pressure to offset friction loss in piping and identifying a piping material, diameter and length using the equation in Section AR105.6.2.1 and the procedure in Section AR105.6.2.2.

AR105.6.2.1 Available pressure equation. The pressure available to offset friction loss in the interior piping system (Pt) shall be determined in accordance with Equation AR-1.

$$P_t = P_{sup} - PL_{svc} - PL_m - PL_d - PL_e - P_{sp}$$

(Equation AR-1)

Where:

P_t	=	Pressure used in applying Tables AR105.6.2(4) through AR105.6.2(9).
P_{sup}	=	Pressure available from the water supply source.
PL_{svc}	=	Pressure loss in the water-service pipe.
PL_m	=	Pressure loss in the water meter.
PL_d	=	Pressure loss from devices other than the water meter.
PL_e	=	Pressure loss associated with changes in elevation.
P_{sp}	=	Maximum pressure required by a sprinkler.

AR105.6.2.2 Calculation procedure. Determination of the required size for water distribution piping shall be in accordance with the following procedure:

Step 1 - Determine P_{sup}

Obtain the static supply pressure that will be available from the water main from the water purveyor, or for an individual source, the available supply pressure shall be in accordance with Section AR105.5.1.

Step 2 - Determine PL_{svc}

Use Table P2904.6.2(1) to determine the pressure loss in the water service pipe based on the selected size of the water service.

Step 3 - Determine PL_m

Use Table P2904.6.2(2) to determine the pressure loss from the water meter, based on the selected water meter size.

Step 4 - Determine PL_d

Determine the pressure loss from devices other than the water meter installed in the piping system supplying sprinklers, such as pressure-reducing valves, backflow preventers, water softeners or water filters. Device pressure losses shall be based on the device manufacturer's specifications. The flow rate used to determine pressure loss shall be the rate from Section AR105.4.2, except that 5 gpm (0.3 L/S) shall be added where the device is installed in a water-service pipe that supplies more than one dwelling. As alternative to deducting pressure loss for a device, an automatic bypass valve shall be installed to divert flow around the device when a sprinkler activates.

Step 5 - Determine PL_e

Use Table P2904.6.2(3) to determine the pressure loss associated with changes in elevation. The elevation used in applying the table shall be the difference between the elevation where the water source pressure was measured and the elevation of the highest sprinkler.

Step 6 - Determine P_{sp}

Determine the maximum pressure required by any individual sprinkler based on the flow rate from Section AR105.4.1. The required pressure is provided in the sprinkler manufacturer's published data for the specific sprinkler model based on the selected flow rate.

Step 7 - Calculate P_t

Using Equation AR-1, calculate the pressure available to offset friction loss in water-distribution piping between the service valve and the sprinklers.

Step 8 - Determine the maximum allowable pipe length

Use Tables P2904.6.2(4) through P2904.6.2(9) to select a material and size for water distribution piping. The piping material and size shall be acceptable if the developed length of pipe between the service valve and the most remote sprinkler does not exceed the maximum allowable length specified by the applicable table. Interpolation of P_t between the tabular values shall be permitted.

The maximum allowable length of piping in Tables P2904.6.2(4) through P2904.6.2(9) incorporates an adjustment for pipe fittings, and no additional consideration of friction losses associated with pipe fittings shall be required.

AR105.7 Instructions and signs. An owner's manual for the fire sprinkler system shall be provided to the owner. A sign or valve tag shall be installed at the main shutoff valve to the water distribution system stating the following: "Warning, the water system for this home supplies fire sprinklers that require certain flows and pressures to fight a fire. Devices that restrict the flow or decrease the pressure or automatically shutoff the water to the fire sprinkler system, such as water softeners, filtration systems and automatic shutoff valves, shall not be added to this system without a review of the fire sprinkler system by a fire protection specialist. Do not remove this sign."

AR105.8 Inspections. The water distribution system shall be inspected in accordance with Sections AR105.8.1 and AR105.8.2.

AR105.8.1 Preconcealment Inspection. The following items shall be verified prior to the concealment of any sprinkler system piping:

1. Sprinklers are installed in all areas as required by Section AR105.1.1.

2. Where sprinkler water spray patterns are obstructed by construction features, luminaires or ceiling fans, additional sprinklers are installed as required by Section AR105.2.4.2.

3. Sprinklers are the correct temperature rating and are installed at or beyond the required separation distances from heat sources as required by Sections AR105.2.1 and AR105.2.2.

4. The pipe size equals or exceeds the size used in applying Tables P2904.6.2(4) through P2904.6.2(9) or, if the piping system was hydraulically calculated in accordance with Section AR105.6.1, the size used in the hydraulic calculation.

5. The pipe length does not exceed the length permitted by Tables AR105.6.2(4) through AR105.6.2(9) or, if the piping system was hydraulically calculated in accordance with Section AR105.6.1, pipe lengths and fittings do not exceed those used in the hydraulic calculation.

6. Nonmetallic piping that conveys water to sprinklers is listed for use with fire sprinklers.

7. Piping is supported in accordance with the pipe manufacturer's and sprinkler manufacturer's installation instructions.

8. The piping system is tested in accordance with the plumbing code.

AR105.8.2 Final inspection. The following items shall be verified upon completion of the system:

1. Sprinklers are not painted, damaged or otherwise hindered from operation.

2. Where a pump is required to provide water to the system, the pump starts automatically upon system water demand.

3. Pressure-reducing valves, water softeners, water filters or other impairments to water flow that were not part of the original design have not been installed.

4. The sign or valve tag required by Section AR105.7 is installed and the owner's manual for the system is present.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 10-03-098, § 51-51-60105, filed 1/20/10, effective 7/1/10.]

WAC 51-51-60107 Appendix S—Fire sprinklers. The provisions contained in this appendix are not mandatory unless specifically referenced in the adopting ordinance.

AS107.1 Fire sprinklers. An approved automatic fire sprinkler system shall be installed in new one-family and two-family dwellings and townhouses in accordance with Appendix R.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 10-03-098, § 51-51-60107, filed 1/20/10, effective 7/1/10.]

Chapter 51-52 WAC

STATE BUILDING CODE ADOPTION AND AMENDMENT OF THE 2009 EDITION OF THE INTERNATIONAL MECHANICAL CODE

(Formerly chapter 51-42 WAC)

WAC

51-52-003 International Mechanical Code.
51-52-005 Reserved.
51-52-008 Implementation.
51-52-0101 Section 101—General.
51-52-0202 Section 202—General definitions.
51-52-0306 Section 306—Access and service space.
51-52-0401 Section 401—General.
51-52-0403 Section 403—Mechanical ventilation.
51-52-0404 Section 404—Enclosed parking garages and automobile repair facilities.
51-52-0501 Section 501—General.
51-52-0504 Section 504—Clothes dryer exhaust.
51-52-0505 Section 505—Domestic kitchen exhaust equipment.
51-52-0506 Section 506—Commercial kitchen hood ventilation system ducts and exhaust equipment.
51-52-0507 Section 507—Commercial kitchen hoods.
51-52-0601 Section 601—General.
51-52-0603 Section 603—Duct construction and installation.
51-52-0606 Section 606—Smoke detection systems control.
51-52-1000 Chapter 10—Boilers, water heaters and pressure vessels.
51-52-1500 Chapter 15—Referenced standards.
51-52-21101 Section 101—General.

WAC 51-52-003 International Mechanical Code. The 2009 edition of the *International Mechanical Code* published by the International Code Conference is hereby adopted by reference with the exceptions noted in this chapter of the Washington Administrative Code (WAC).

[Statutory Authority: RCW 19.27.190, 19.27.074, 19.27.031 and chapters 19.27 and 34.05 RCW. 10-03-099, § 51-52-003, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.190, 19.27.020, and chapters 19.27 and 34.05 RCW. 07-01-092, § 51-52-003, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-104, § 51-52-003, filed 12/17/03, effective 7/1/04.]

WAC 51-52-005 Reserved.

[Statutory Authority: RCW 19.27.190, 19.27.074, 19.27.031 and chapters 19.27 and 34.05 RCW. 10-03-099, § 51-52-005, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-104, § 51-52-005, filed 12/17/03, effective 7/1/04.]

WAC 51-52-008 Implementation. The International Mechanical Code adopted by chapter 51-52 WAC shall become effective in all counties and cities of this state on July 1, 2010.

[Statutory Authority: RCW 19.27.190, 19.27.074, 19.27.031 and chapters 19.27 and 34.05 RCW. 10-03-099, § 51-52-008, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.190, 19.27.020, and chapters 19.27 and 34.05 RCW. 07-01-092, § 51-52-008, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-104, § 51-52-008, filed 12/17/03, effective 7/1/04.]

WAC 51-52-0101 Section 101—General.

101.2 Scope. This code shall regulate the design, installation, maintenance, alteration and inspection of mechanical systems that are permanently installed and utilized to provide control of environmental conditions and related processes within buildings. This code shall also regulate those mechanical systems, system components, equipment and appliances specifically addressed herein. The installation of fuel gas distribution piping and equipment, fuel gas-fired appliances and fuel gas-fired appliance venting systems shall be regulated by the *International Fuel Gas Code*.

EXCEPTIONS: 1. Detached one- and two-family dwellings and multiple single-family dwellings (townhouses) not more than three stories high with separate means of egress and their accessory structures shall comply with the *International Residential Code*.

2. The standards for liquefied petroleum gas installations shall be the 2008 Edition of NFPA 58 (Liquefied Petroleum Gas Code) and the 2009 Edition of ANSI Z223.1/NFPA 54 (National Fuel Gas Code).

[Statutory Authority: RCW 19.27.190, 19.27.074, 19.27.031 and chapters 19.27 and 34.05 RCW. 10-03-099, § 51-52-0101, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.190, 19.27.020, and chapters 19.27 and 34.05 RCW. 07-01-092, § 51-52-0101, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-104, § 51-52-0101, filed 12/17/03, effective 7/1/04.]

WAC 51-52-0202 Section 202—General definitions.

SOURCE SPECIFIC VENTILATION. A mechanical ventilation system including all fans, controls, and ducting, which is dedicated to exhausting contaminant-laden air to the exterior of the building from the room or space in which the contaminant is generated.

UNUSUALLY TIGHT CONSTRUCTION. Construction meeting the following requirements:

1. Walls exposed to the outdoor atmosphere having a continuous water vapor retarder with a rating of 1 perm (57 ng/s·m²·Pa) or less with openings gasketed or sealed; and

2. Operable windows and doors meeting the air leakage requirements of the *International Energy Conservation Code,* Section 502.1.4; and

3. Caulking or sealants are applied to areas such as joints around window and door frames, between sole plates and floors, between wall-ceiling joints, between wall panels, at penetrations for plumbing, electrical and gas lines, and at other openings; or

4. Buildings built in compliance with the 1986 or later editions of the Washington State Energy Code, chapter 51-11 WAC, Northwest Energy Code, or Super Good Cents weatherization standards or equivalent.

WHOLE HOUSE VENTILATION SYSTEM. A mechanical ventilation system, including fans, controls, and ducts, which replaces, by direct or indirect means, air from the habitable rooms with outdoor air.

[Statutory Authority: RCW 19.27.190, 19.27.074, 19.27.031 and chapters 19.27 and 34.05 RCW. 10-03-099, § 51-52-0202, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.190, 19.27.020, and chapters 19.27 and 34.05 RCW. 07-01-092, § 51-52-0202, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-104, § 51-52-0202, filed 12/17/03, effective 7/1/04.]

WAC 51-52-0306 Section 306—Access and service space.

306.5 Equipment and appliances on roofs or elevated structures. Where equipment requiring access and appliances are installed on roofs or elevated structures at a height exceeding 16 feet (4877 mm), such access shall be provided by a permanent approved means of access, the extent of which shall be from grade or floor level to the equipment and appliances' level service space. Such access shall not require climbing over obstructions greater than 30 inches (762 mm) high or walking on roofs having a slope greater than 4 units vertical in 12 units horizontal (33 percent slope). Where access involves climbing over parapet walls, the height shall be measured to the top of the parapet wall.

Permanent ladders installed to provide the required access shall comply with the following minimum design criteria:

1. The side railing shall extend above the parapet or roof edge not less than 42 inches (1067 mm).

2. Ladders shall have rung spacing not to exceed 12 inches (305 mm) on center.

3. Ladders shall have a toe spacing not less than 7 inches (178 mm) deep.

4. There shall be a minimum of 18 inches (457 mm) between rails.

5. Rungs shall have a minimum 0.75-inch (19 mm) diameter and be capable of withstanding a 300-pound (136.1 kg) load.

6. Ladders over 30 feet (9144 mm) in height shall be provided with offset sections and landings capable of withstanding 100 pounds (488.2 kg/m²) per square foot.

7. Ladders shall be protected against corrosion by approved means.

Catwalks installed to provide the required access shall be not less than 24 inches (610 mm) wide and shall have railings as required for service platforms.

EXCEPTION: This section shall not apply to Group R-3 occupancies.

[Statutory Authority: RCW 19.27.190, 19.27.074, 19.27.031 and chapters 19.27 and 34.05 RCW. 10-03-099, § 51-52-0306, filed 1/20/10, effective 7/1/10.]

WAC 51-52-0401 Section 401—General.

401.2 Ventilation required. Every occupied space other than enclosed parking garages and buildings used for repair of automobiles shall be ventilated in accordance with Section 402.2.1 or 401.2.2. Enclosed parking garages and buildings used for repair of automobiles shall be ventilated by mechanical means in accordance with Sections 403 and 404.

401.2.1 Group R occupancies. Ventilation in Group R occupancies shall be provided in accordance with Section 403.8.

401.2.2 All other occupancies. Ventilation in all other occupancies shall be provided by natural means in accordance with Section 402 or by mechanical means in accordance with Sections 403.1 to 403.7.

401.7 Testing and balancing. At the discretion of the building official, flow testing may be required to verify that the mechanical system(s) satisfies the requirements of this chapter. Flow testing may be performed using flow hood measuring at the intake or exhaust points of the system, in-line pitot tube, or pitot-traverse type measurement systems in the duct, short term tracer gas measurements, or other means approved by the building official.

[Statutory Authority: RCW 19.27.190, 19.27.074, 19.27.031 and chapters 19.27 and 34.05 RCW. 10-03-099, § 51-52-0401, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.190, 19.27.020, and chapters 19.27 and 34.05 RCW. 07-01-092, § 51-52-0401, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.020, 19.27.031, 19.27.074 and chapters 19.27 and 34.05 RCW. 05-01-015, § 51-52-0401, filed 12/2/04, effective 7/1/05.]

WAC 51-52-0403 Section 403—Mechanical ventilation.

403.2 Outdoor air required. The minimum ventilation rate of outdoor air shall be determined in accordance with Section 403.3.

EXCEPTIONS: 1. Where the registered design professional demonstrates that an engineered ventilation system design will prevent the maximum concentration of contaminants from exceeding that obtainable by the rate of outdoor air ventilation determined in accordance with Section 403.3, the minimum required rate of outdoor air shall be reduced in accordance with such engineered system design.

2. Alternate systems designed in accordance with ASHRAE Standard 62.1 Section 6.2, Ventilation Rate Procedure, shall be permitted.

403.2.1 Recirculation of air. The air required by Section 403.3 shall not be recirculated. Air in excess of that required by Section 403.3 shall not be prohibited from being recirculated as a component of supply air to building spaces, except that:

1. Ventilation air shall not be recirculated from one dwelling to another or to dissimilar occupancies.

2. Supply air to a swimming pool and associated deck areas shall not be recirculated unless such air is dehumidified to maintain the relative humidity of the area at 60 percent or less. Air from this area shall not be recirculated to other spaces where 10 percent or more of the resulting supply airstream consists of air recirculated from these spaces.

3. Where mechanical exhaust is required by Note b in Table 403.3, recirculation of air from such spaces shall be prohibited. All air supplied to such spaces shall be exhausted, including any air in excess of that required by Table 403.3.

(Item 4 is not adopted.)

403.3 Outdoor airflow rate. Ventilation systems shall be designed to have the capacity to supply the minimum outdoor airflow rate determined in accordance with this section. The occupant load utilized for design of the ventilation system shall not be less than the number determined from the estimated maximum occupant load rate indicated in Table 403.3. Ventilation rates for occupancies not represented in Table 403.3 shall be those for a listed occupancy classification that is most similar in terms of occupant density, activities and building construction; or shall be determined by an approved engineering analysis. The ventilation system shall be designed to supply the required rate of ventilation air continuously during the period the building is occupied, except as otherwise stated in other provisions of the code.

With the exception of smoking lounges, the ventilation rates in Table 403.3 are based on the absence of smoking in occupiable spaces. Where smoking is anticipated in a space other than a smoking lounge, the ventilation system serving the space shall be designed to provide ventilation over and above that required by Table 403.3 in accordance with accepted engineering practice.

EXCEPTION: Where occupancy density is known and documented in the plans, the outside air rate may be based on the design occupant density. Under no circumstance shall the occupancies used result in outside air less than one-half that resulting from application of Table 403.3 estimated maximum occupancy rates.

Table 403.3
Required Outdoor Ventilation Air

Occupancy Classification	People Outdoor Airflow Rate in Breathing Zone cfm/Person	Area Outdoor Airflow Rate in Breathing Zone R_a cfm/ft^{2a}	Default Occupant Density #/1000 ft^{2a}	Exhaust Airflow Rate cfm/ft^2
Correctional facilities				
Cells				
without plumbing fixtures	5	0.12	25	—
with plumbing fixtures	5	0.12	25	1.0
Dining halls (see food and beverage service)	—	—	—	—
Guard stations	5	0.06	15	—
Day room	5	0.06	30	—
Booking/waiting	7.5	0.06	50	—
Dry cleaners, laundries				
Coin-operated dry cleaner	15	—	20	—
Coin-operated laundries	7.5	0.06	20	—
Commercial dry cleaner	30	—	30	—
Commercial laundry	25	—	10	—
Storage, pick up	7.5	0.12	30	—
Education				
Art classroom	10	0.18	20	0.7
Auditoriums	5	0.06	150	—
Classrooms (ages 5-8)	10	0.12	25	—
Classrooms (ages 9 plus)	10	0.12	35	—
Computer lab	10	0.12	25	—
Corridors (see public spaces)	—	—	—	—
Day care (through age 4)	10	0.18	25	—
Lecture classroom	7.5	0.06	65	—
Lecture hall (fixed seats)	7.5	0.06	150	—
Locker/dressing room	—	—	—	0.25
Media center	10	0.12	25	—
Multiuse assembly	7.5	0.06	100	—
Music/theater/dance	10	0.06	35	—
Science laboratories	10	0.18	25	1.0
Smoking lounges[b]	60	—	70	—
Sports locker rooms	—	—	—	0.5
Wood/metal shops	10	0.18	20	0.5
Food and beverage service				
Bars, cocktail lounges	7.5	0.18	100	—
Cafeteria, fast food	7.5	0.18	100	—
Dining rooms	7.5	0.18	70	—
Kitchens (cooking)[b]	—	—	—	0.7

Occupancy Classification	People Outdoor Airflow Rate in Breathing Zone cfm/Person	Area Outdoor Airflow Rate in Breathing Zone R_a cfm/ft^{2a}	Default Occupant Density #/1000 ft^{2a}	Exhaust Airflow Rate cfm/ft^2
Hospitals, nursing and convalescent homes				
Autopsy rooms[b]	—	—	—	0.5
Medical procedure rooms	15	—	20	
Operating rooms	30	—	20	
Patient rooms	25	—	10	
Physical therapy	15	—	20	
Recovery and ICU	15	—	20	
Hotels, motels, resorts and dormitories				
Multipurpose assembly	5	0.06	120	—
Bathrooms/toilet—private	—	—	—	25/50[f]
Bedroom/living room	5	0.06	10	—
Conference/meeting	5	0.06	50	—
Dormitory sleeping areas	5	0.06	20	—
Gambling casinos	7.5	0.18	120	—
Kitchens	—	—	—	25/100[f]
Lobbies/prefunction	7.5	0.06	30	—
Offices				
Conference rooms	5	0.06	50	—
Office spaces	5	0.06	5	—
Reception areas	60	0.06	30	—
Telephone/data entry	5	0.06	60	—
Main entry lobbies	5	0.06	10	—
Private dwellings, single and multiple				
Garages, common for multiple units[b]	—	—	—	0.75
Garages, separate for each dwelling[b]	—	—	—	100 cfm per car
Kitchens[b]	—			25/100[f]
Living areas[c]	See Tables 403.8.5.1 and 403.8.5.2	—	Based on the number of bedrooms. First bedroom: 2; each additional bedroom, 1	—
Toilet rooms, bathrooms and laundry areas[i]	—			20/50[f]
Public spaces				
Corridors	—	0.06	—	—
Elevator car	—	—	—	1.0
Shower room (per shower head)	—	—	—	50/20[f]
Smoking lounges[b]	60	—	70	—
Toilet rooms - public	—	—	—	50/70[e]
Places of religious worship	5	0.06	120	—
Courtrooms	5	0.06	70	—
Legislative chambers	5	0.06	50	—
Libraries	5	0.12	10	—
Museums (children's)	7.5	0.12	40	—
Museums/galleries	7.5	0.06	40	—
Retail stores, sales floors and showroom floors				
Sales (except as below)	7.5	0.12	15	—
Dressing rooms	—	—	—	0.25
Mall common areas	7.5	0.06	40	—
Shipping and receiving	—	0.12	—	—
Smoking lounges[b]	60	—	70	—
Storage rooms	—	0.12	—	—
Warehouses (see storage)	—	—	—	—
Specialty shops				
Automotive motor-fuel-dispensing stations[b]	—	—	—	1.5
Barber	7.5	0.06	25	0.5
Beauty and nail salons[b,h]	20	0.12	25	0.6
Embalming room[b]	—	—	—	2.0
Pet shops (animal areas)[b]	7.5	0.18	10	0.9
Supermarkets	7.5	0.06	8	—
Sports and amusement				
Disco/dance floors	20	0.06	100	—
Bowling alleys (seating areas)	10	0.12	40	—
Game arcades	7.5	0.18	20	—

Occupancy Classification	People Outdoor Airflow Rate in Breathing Zone cfm/Person	Area Outdoor Airflow Rate in Breathing Zone R_a cfm/ft^{2a}	Default Occupant Density #/1000 ft^{2a}	Exhaust Airflow Rate cfm/ft^2
Ice arenas, without combustion engines	—	0.30	—	0.5
Gym, stadium arena (play area)	—	0.30	—	—
Spectator areas	7.5	0.06	150	—
Swimming pools (pool and deck area)	—	0.48	—	—
Health club/aerobics room	20	0.06	40	—
Health club/weight room	20	0.06	10	—
Storage				
Repair garages, enclosed parking garage[b,d]	—	—	—	0.75
Warehouses	—	0.06	—	—
Theaters				
Auditoriums (see education)			—	—
Lobbies	5	0.06	150	—
Stages, studios	10	0.06	70	—
Ticket booths	5	0.06	60	—
Transportation				
Platforms	7.5	0.06	100	—
Transportation waiting	7.5	0.06	100	—
Workrooms				
Bank vaults/safe deposit	5	0.06	5	—
Darkrooms	—	—	—	1.0
Copy, printing rooms	5	0.06	4	0.5
Meat processing[c]	15	—	10	—
Pharmacy (prep area)	5	0.18	10	—
Photo studios	5	0.12	10	—
Computer (without printing)	5	0.06	4	—

For SI: 1 cubic foot per minute = 0.0004719 m^3/s, 1 ton = 908 kg, 1 cubic foot per minutes per square foot = 0.00508 $m^3/(s \cdot m^2)$, °C = [(°F) -32]/1.8, 1 square foot - 0.0929 m^2.

a. Based upon net occupiable floor area.

b. Mechanical exhaust required and the recirculation of air from such spaces is prohibited (see Section 403.2.1, Item 3).

c. Spaces unheated or maintained below 50°F are not covered by these requirements unless the occupancy is continuous.

d. Ventilation systems in enclosed parking garages shall comply with Section 404.

e. Rates are per water closet or urinal. The higher rate shall be provided where periods of heavy use are expected to occur, such as toilets in theaters, schools and sports facilities. The lower rate shall be permitted where periods of heavy use are not expected.

f. Rates are per room unless otherwise indicated. The higher rate shall be provided where the exhaust system is designed to operate intermittently. The lower rate shall be permitted where the exhaust system is designed to operate continuously during normal hours of use.

g. Reserved.

h. For nail salons, the required exhaust shall include ventilation tables or other systems that capture the contaminants and odors at their source and are capable of exhausting a minimum of 50 cfm per station.

i. A laundry area within a kitchen or bathroom is not required to have source specific exhaust. Where there are doors that separate the laundry area from the kitchen or bathroom the door shall be louvered.

403.8 Ventilation systems for Group R occupancies. Each dwelling unit or guest room shall be equipped with source specific and whole house ventilation systems and shall comply with Sections 403.8.1 through 403.8.11. All public corridors and other than Group R occupied spaces that support the Group R occupancy shall meet the ventilation requirements of Section 402 or Sections 403.1 to 403.7.

403.8.1 Minimum ventilation performance. Ventilation systems shall be designed and installed to satisfy the ventilation requirements of Table 403.3 or Table 403.8.1.

Table 403.8.1
Ventilation Rates for All Group R Private Dwellings, Single and Multiple
(Continuously Operating Systems)

Floor Area (ft^2)	Bedrooms[1]				
	0-1	2-3	4-5	6-7	>7
<1500	30	45	60	75	90
1501 - 3000	45	60	75	90	105
3001 - 4500	60	75	90	105	120
4501 - 6000	75	90	105	120	135
6001 - 7500	90	105	120	135	150
>7500	105	120	135	150	165

1 Ventilation rates in table are minimum outdoor airflow rates measured in cfm.

403.8.2 Control and operation.

1. Location of controls. Controls for all ventilation systems shall be readily accessible by the occupant.

2. Instructions. Operating instructions for whole house ventilation systems shall be provided to the occupant by the installer of the system.

3. Source specific ventilation systems. Source specific ventilation systems shall be controlled by manual switches, dehumidistats, timers, or other approved means.

4. Continuous whole house ventilation systems. Continuous whole house ventilation systems shall operate continuously. Exhaust fans, forced-air system fans, or supply fans shall be equipped with "fan on" as override controls. Controls shall be capable of operating the ventilation system without energizing other energy-consuming appliances. A label shall be affixed to the controls that reads "Whole House Ventilation (see operating instructions)."

5. Intermittent whole house ventilation systems. Intermittent whole house ventilation systems shall comply with the following:

5.1 They shall be capable of operating intermittently and continuously.

5.2 They shall have controls capable of operating the exhaust fans, forced-air system fans, or supply fans without energizing other energy-consuming appliances.

5.3 The ventilation rate shall be adjusted according to the exception in Section 403.8.5.1.

5.4 The system shall be designed so that it can operate automatically based on the type of control timer installed.

5.5 The intermittent mechanical ventilation system shall operate at least one hour out of every twelve.

5.6 The system shall have a manual control and automatic control, such as a 24-hour clock timer.

5.7 At the time of final inspection, the automatic control shall be set to operate the whole house fan according to the schedule used to calculate the whole house fan sizing.

5.8 A label shall be affixed to the control that reads "Whole House Ventilation (see operating instructions)."

403.8.3 Outdoor air intake locations. Outdoor air intakes shall be classified as either operable openings or mechanical air intakes and shall be located per the following criteria. The intake locations for operable openings and mechanical air intakes shall comply with the following:

1. Openings for mechanical air intakes shall comply with Section 401.4. Operable openings shall comply with Section 401.4 items 2 and 4 only.

2. Intake openings shall not be located closer than 10 feet from an appliance vent outlet unless such vent outlet is 3 feet above the outdoor air inlet. The vent shall be permitted to be closer if specifically allowed by Chapter 8 or by the International Fuel Gas Code.

3. Intake openings shall be located where they will not pick up objectionable odors, fumes, or flammable vapors.

4. Intake openings shall be located where they will not take air from a hazardous or unsanitary location.

5. Intake openings shall be located where they will not take air from a room or space having a fuel-burning appliances.

6. Intake openings shall not be located closer than 10 feet from a vent opening of a plumbing drainage system unless the vent opening is at least 3 feet above the air inlet.

7. Intake openings shall not be located where they will take air from an attic, crawl space, or garage.

403.8.4 Source specific ventilation requirements. Source specific exhaust ventilation systems shall exhaust at least the volume of air required for exhaust in Table 403.3. Exhaust shall be provided in each kitchen, bathroom, water closet, laundry area, indoor swimming pool, spa, and other room where water vapor or cooking odor is produced.

403.8.4.1 Source specific exhaust systems. Exhaust systems shall be designed and installed to meet all of the criteria below:

1. Source specific exhaust shall be discharged outdoors.

2. Exhaust outlets shall comply with Section 501.2.

3. Pressure equalization shall comply with Section 501.3.

4. Exhaust ducts in systems which are designed to operate intermittently shall be equipped with back-draft dampers.

5. All exhaust ducts in unconditioned spaces shall be insulated to a minimum of R-4.

6. Terminal outlet elements shall have at least the equivalent net free area of the ductwork.

7. Terminal outlet elements shall be screened or otherwise protected as required by Section 501.2.2.

8. Exhaust fans in separate dwelling units or guest rooms shall not share common exhaust ducts unless the system is engineered for this operation.

9. Where permitted by Chapter 5, multiple source specific exhaust ducts may be combined. If more than one of the exhaust fans in a dwelling unit or guest room shares a common exhaust duct then each exhaust fan shall be equipped with a back-draft damper to prevent the recirculation of exhaust air from one room to another room via the exhaust ducting system.

403.8.4.2 Source specific exhaust fans. Exhaust fan construction and sizing shall meet the following criteria.

1. Exhaust fans shall be tested and rated in accordance with the airflow and sound rating procedures of the Home Ventilating Institute (HVI 915, HVI Loudness Testing and Rating Procedure, HVI 916, HVI Airflow Test Procedure, and HVI 920, HVI Product Performance Certification Procedure).

EXCEPTION: Where a range hood or down draft exhaust fan is used for source specific exhaust for a kitchen, the device is not required to be rated per these standards.

2. Installation of the system or equipment shall be carried out in accordance with manufacturers' installation instructions.

3. Fan airflow rating and duct system shall be designed and installed to deliver at least the exhaust airflow required by Table 403.3. The airflows required refer to the delivered airflow of the system as installed and tested using a flow hood, flow grid, or other airflow measurement device.

EXCEPTIONS: 1. An exhaust airflow rating at a pressure of 0.25 in. w.g. may be used, provided the duct sizing meets the prescriptive requirements of Table 403.8.4.2.

2. Where a range hood or down draft exhaust fan is used to satisfy the source specific ventilation requirements for kitchens, the range hood or down draft exhaust shall not be less than 100 cfm at 0.10 in. w.g.

Table 403.8.4.2
Prescriptive Exhaust Duct Sizing

Fan Tested cfm at 0.25 inches w.g.	Minimum Flex Diameter	Maximum Length in Feet	Minimum Smooth Diameter	Maximum Length in Feet	Maximum Elbows[1]
50	4 inches	25	4 inches	70	3
50	5 inches	90	5 inches	100	3
50	6 inches	No Limit	6 inches	No Limit	3
80	4 inches[2]	NA	4 inches	20	3
80	5 inches	15	5 inches	100	3
80	6 inches	90	6 inches	No Limit	3
100	5 inches[2]	NA	5 inches	50	3
100	6 inches	45	6 inches	No Limit	3
125	6 inches	15	6 inches	No Limit	3
125	7 inches	70	7 inches	No Limit	3

1. For each additional elbow, subtract 10 feet from length.
2. Flex ducts of this diameter are not permitted with fans of this size.

403.8.5 Whole house ventilation requirements. Each dwelling unit or guest room shall be equipped with one of the following four types of mechanical whole house ventilation systems: A system using exhaust fans (see Section 403.8.6); a system integrated with forced-air systems (see Section 403.8.7); a system using supply fans (see Section 403.8.8); or a heat or energy recovery ventilation system (see Section 403.8.9).

403.8.5.1 Outdoor air. Outdoor air shall be distributed to each habitable space.

Where outdoor air supply intakes are separated from exhaust vents by doors, means shall be provided to ensure airflow to all separated habitable spaces by installing distribution ducts, installed grilles, transoms, doors undercut to a minimum of 1/2-inch above the surface of the finish floor covering, or other similar means where permitted by the International Building Code.

The mechanical system shall operate continuously to supply at least the volume of outdoor air required in Table 403.3 or Table 403.8.1.

EXCEPTION: Intermittently operating ventilation systems: The mechanical system shall have controls for intermittent operation per Section 403.8.2 and shall supply at least the volume of outdoor air required for intermittent operation based on the combination of its delivered capacity (from Table 403.3 or Table 403.8.1), its ventilation effectiveness (from Table 403.8.5.1) and its daily fractional operation time (from Table 403.8.5.1) using the formula:

$$Qf = Qr/(\in f)$$

Where:

Qf	=	outdoor air flow rate
Qr	=	ventilation air requirement (from Table 403.3 or 403.8.1)
$\in$	=	ventilation effectiveness (from Table 403.8.5.1)
f	=	fractional operation time (from Table 403.8.5.1)

Table 403.8.5.1
Ventilation Effectiveness for Intermittent Fans

Daily Fractional Operation Time, f	Ventilation Effectiveness, $\in$
$f \leq 35\%$	0.33
$35\% \leq f < 60\%$	0.50
$60\% \leq f < 80\%$	0.75
$80\% \leq f$	1.0

403.8.5.2 Whole house supply system general requirements. Whole house ventilation systems integrated with a forced-air system, systems using supply fans and systems using a heat or energy recovery ventilation system shall comply with the following.

1. Outdoor air louvers shall be adequately sized for the required airflow and shall comply with Section 401.5. Outdoor air intake locations shall comply with mechanical air intakes requirements of Section 403.8.3.

2. Outdoor air ducts for dedicated or central supply systems and exhaust ducts for heat or energy recovery systems shall be provided with a means for balancing the system to the required airflow via balance dampers or other devices.

3. Outdoor air ducts, for dedicated or central systems shall be provided with motorized dampers.

EXCEPTION: Outdoor air ducts at heat or energy ventilation systems are not required to have motorized dampers.

4. Ducts in the conditioned space shall be insulated to a minimum of R-4. In heat or energy recovery ventilation systems, ducts upstream of the heat exchanger shall also be insulated to at least R-4.

5. All outdoor air ducts shall be designed and installed to deliver at least the outdoor airflow required by Section 403.8.5.1. The airflows required refer to the delivered airflow of the system as installed and tested using a flow hood, flow grid, or other airflow measurement device.

EXCEPTION: The outdoor air duct for supply fan systems and heat or energy recovery systems may be prescriptively sized per Table 403.8.5.2 for dedicated outdoor air ducts upstream of the supply fan. Supply fans shall have the capacity to provide the amount of outdoor air required by Section 403.8.5.1 at 0.40 in. w.g. as per HVI 916 (April 1995). When prescriptively sized the system shall be tested and balanced using a flow hood, flow-grid, or other airflow measurement device.

6. Whole house ventilation controls for continuous and intermittent operation shall be provided at both the forced-air fan and the motorized damper.

Table 403.8.5.2
Prescriptive Supply Fan Duct Sizing

Supply Fan Tested cfm at 0.40" w.g.		
Specified Volume from Table 408.1	Minimum Smooth Duct Diameter	Minimum Flexible Duct Diameter
50 - 90 cfm	4 inch	5 inch
90 - 150 cfm	5 inch	6 inch
150 - 250 cfm	6 inch	7 inch
250 - 400 cfm	7 inch	8 inch

403.8.6 Whole house ventilation with exhaust fan systems. This section establishes minimum requirements for mechanical whole house ventilation systems using exhaust fans.

403.8.6.1 Outdoor air. Exhaust fan only ventilation systems shall provide outdoor air through one of the following methods:

1. Outdoor air may be drawn through air inlets installed in exterior walls or windows. For interior spaces without openings to the outdoor, air inlets cannot be used unless a transfer fan is provided in compliance with Section 403.8.6.1 Item 3. The air inlets shall comply with all of the following:

a. Inlets shall have controllable, secure openings and shall be designed to not compromise the thermal properties of the building envelope.

b. Inlets shall be accessible to occupants.

c. Inlets shall be screened or otherwise protected from entry by insects, leaves, or other material.

d. Inlets shall provide not less than 4 square inches of net free area of opening for each 10 cfm of outdoor air required in Table 403.3 or Table 403.8.1.

e. Any inlet or combination of inlets which provide 10 cfm at 10 Pascals as determined by the Home Ventilation Institute Air Flow Test Standard (HVI 901 (November 1996)) are deemed equivalent to 4 square inches of net free area.

f. Each occupiable space shall have a minimum of one air inlet that has a minimum of 4 square inches of net free area.

2. In high-rise buildings, outdoor air may be drawn in through operable windows, doors, louvers or other operable openings to the outdoors. Exterior spaces shall have a minimum openable area of 4 percent of the total floor area being ventilated. Doors exiting to a corridor, court or public way shall not be used to provide outdoor air. For interior spaces without openings to the outdoors, the opening to the adjoining room shall be unobstructed and shall have an area of not less than 8 percent of the floor area of the interior room or space, but not less than 25 square feet. The operable openings shall comply with the following:

a. Openings shall be controllable, securable, and shall be designed to not compromise the thermal properties of the building envelope.

b. Openings shall be accessible to occupants.

3. For interior spaces, in buildings with air inlets in accordance with Section 403.8.6.1 Item 1 or in high-rise building without operable openings in accordance with Section 403.8.6.1 Item 2 shall have a whole house transfer fan sized to provide a minimum of the ventilation rate required per Section 403.8.5.1. The transfer fan shall circulate air between the interior room or space and the adjacent habitable space. The transfer fan may operate continuously or intermittently using controls per Section 403.8.2.

403.8.6.2 Outside air intake locations. All outside air intake opening types described in Section 403.8.6.1 shall be classified operable openings and shall not be classified as mechanical air intakes. The intake locations shall comply with Section 403.8.3.

403.8.6.3 Whole house exhaust system. Whole house exhaust system shall be designed and installed to meet all of the applicable criteria below:

1. Whole house ventilation exhaust shall be discharged outdoors.

2. Exhaust outlets shall comply with Section 501.2.

3. Exhaust ducts in systems which are designed to operate intermittently shall be equipped with back-draft dampers.

4. All exhaust ducts in unconditioned spaces shall be insulated to a minimum of R-4.5. Terminal outlet elements shall have at least the equivalent net free area of the ductwork.

5. Terminal outlet elements shall be screened or otherwise protected as required by Section 501.2.2.

6. One of the required source specific exhaust fans for the laundry room or bathroom may be designated as the whole house exhaust fan.

7. Exhaust fans in separate dwelling units or guest rooms shall not share common exhaust ducts unless the system is engineered for this operation.

8. Where permitted by Chapter 5 whole house exhaust ducts may be combined with other source specific exhaust ducts. If more than one of the exhaust fans in a dwelling unit or guest room shares a common exhaust duct then each exhaust fan shall be equipped with a back-draft damper to prevent the recirculation of exhaust air from one room to another room via the exhaust ducting system.

403.8.6.4 Whole house exhaust and transfer fans. Exhaust fan construction and sizing shall meet the following criteria.

1. Exhaust and transfer fans shall be tested and rated in accordance with the airflow and sound rating procedures of the Home Ventilating Institute (HVI 915, HVI Loudness Testing and Rating Procedure, HVI 916, HVI Airflow Test Procedure, and HVI 920, HVI Product Performance Certification Procedure).

2. Installation of system or equipment shall be carried out in accordance with manufacturers' design requirements and installation instructions.

3. Fan airflow rating and duct system shall be designed and installed to deliver at least the outdoor airflow required by Table 403.3 or Table 403.8.1. The airflows required refer to the delivered airflow of the system as installed and tested using a flow hood, flow grid, or other airflow measurement device.

EXCEPTION: An airflow rating at a pressure of 0.25 in. w.g. may be used, provided the duct sizing meets the prescriptive requirements of Table 403.8.5.2.

403.8.6.5 Fan noise. Whole house exhaust and transfer fans located 4 feet or less from the interior grille shall have a sone rating of 1.0 or less measured at 0.10 inches water gauge. Manufacturer's noise ratings shall be determined as per HVI 915. Remotely mounted fans shall be acoustically isolated from the structural elements of the building and from attached ductwork using insulated flexible duct or other approved material.

403.8.7 Whole house ventilation integrated with forced-air systems. This section establishes minimum requirements for mechanical whole house ventilation systems using forced-air system fans.

403.8.7.1 Outdoor air. Forced-air system fan ventilation systems shall provide outdoor air through one of the following methods:

1. A dedicated outdoor air louver and outdoor air duct for each dwelling unit or guest room shall supply outdoor air to the return side of the forced-air system fan; or

2. A central outdoor air delivery system that supplies multiple dwelling units or guest rooms shall supply outdoor air to the return side of the forced air system fan.

403.8.7.2 Whole house forced-air system. Where outdoor air is provided to each habitable dwelling unit or guest room by a forced-air system, the outdoor air duct shall be connected to the return air stream at a point within 4 feet upstream of the forced-air unit. It shall not be connected directly to the forced-air unit cabinet in order to prevent thermal shock to the heat exchanger. At a minimum, filtration of the outdoor air shall be provided at the forced-air unit. The filter shall be accessible for regular maintenance and replacement. The filter shall have a Minimum Efficiency Rating Value (MERV) of at least 6.

403.8.8 Whole house ventilation with supply fan systems. This section establishes minimum requirements for mechanical whole house ventilation systems using supply fan systems.

403.8.8.1 Outdoor air. Supply fan ventilation systems shall provide outdoor air through one of the following methods:

1. A dedicated outdoor air louver and outdoor air duct for each dwelling unit or guest room shall supply outdoor air to a supply fan; or

2. A central outdoor air supply fan system shall distribute unconditioned or conditioned air to multiple dwelling units or guest rooms.

403.8.8.2 Whole house supply system. Where outdoor air is provided to each habitable dwelling unit or guest room by supply fan systems the outdoor air shall be filtered.

The system filter may be located at the intake device or inline with the fan. The filter shall be accessible for regular maintenance and replacement. The filter shall have a Minimum Efficiency Rating Value (MERV) of at least 6.

403.8.9 Whole house ventilation with heat recovery or energy recovery ventilation systems. This section establishes minimum requirements for mechanical whole house ventilation systems using heat recovery or energy recovery ventilation systems.

403.8.9.1 Outdoor air. Heat recovery or energy recovery ventilation systems shall provide outdoor air through one of the following methods:

1. A dedicated outdoor air louver and outdoor air duct for each dwelling unit or guest room shall supply outdoor air to the heat recovery or energy recovery ventilator; or

2. A central outdoor air heat recovery or energy recovery unit shall distribute conditioned air to multiple dwelling units or guest rooms.

403.8.9.2 Whole house heat recovery ventilator system. Where outdoor air is provided to each habitable dwelling unit or guest room by heat recovery or energy recovery ventilator the outdoor air shall be filtered. The filter shall be located on the upstream side of the heat exchanger in both the intake and exhaust airstreams with a Minimum Efficiency Rating Value (MERV) of at least 6. The system filter may be located at the intake device or inline with the fan. The filter shall be accessible for regular maintenance and replacement.

403.8.10 Source specific exhaust ventilation and whole house ventilation alternate performance or design requirements. In lieu of complying with Sections 403.8.4 or 403.8.5 compliance with the section shall be demonstrated through engineering calculations by an engineer licensed to practice in the state of Washington or by performance testing. Documentation of calculations or performance test results shall be submitted to and approved by the building official. Performance testing shall be conducted in accordance with approved test methods.

403.8.11 Alternate systems. When approved by the code official, systems designed in accordance with ASHRAE Standard 62.2-2007 shall be permitted.

[Statutory Authority: RCW 19.27.190, 19.27.074, 19.27.031 and chapters 19.27 and 34.05 RCW. 10-03-099, § 51-52-0403, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.190, 19.27.020, and chapters 19.27 and 34.05 RCW. 07-01-092, § 51-52-0403, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.020, 19.27.031, 19.27.074 and chapters 19.27 and 34.05 RCW. 05-01-015, § 51-52-0403, filed 12/2/04, effective 7/1/05.]

Reviser's note: The brackets and enclosed material in the text of the above section occurred in the copy filed by the agency.

WAC 51-52-0404 Section 404—Enclosed parking garages and automobile repair facilities.

404.5 Automobile repair facilities. In buildings used for the repair of automobiles, each repair stall shall be equipped with an exhaust extension duct, extending to the outside of the building. Exhaust extension duct over 10 feet in length shall mechanically exhaust at least 300 cfm. Connecting offices and waiting rooms shall be supplied with conditioned air under positive pressure.

[Statutory Authority: RCW 19.27.190, 19.27.074, 19.27.031 and chapters 19.27 and 34.05 RCW. 10-03-099, § 51-52-0404, filed 1/20/10, effective 7/1/10.]

WAC 51-52-0501 Section 501—General.

501.2 Exhaust discharge. The air removed by every mechanical exhaust system shall be discharged outdoors at a point where it will not cause a nuisance and not less than the distances specified in Section 501.2.1. The air shall be discharged to a location from which it cannot again be readily drawn in by a ventilating system. Air shall not be exhausted into an attic or crawlspace.

EXCEPTIONS: 1. Whole-house cooling fans shall be permitted to discharge into the attic space of dwelling units having private attics.
2. Commercial cooking recirculating systems.

501.2.1 Location of exhaust outlets. The termination point of exhaust outlets and ducts discharging to the outdoors shall be located with the following minimum distances:

1. **For ducts conveying explosive or flammable vapors, fumes or dusts:** 30 feet (9144 mm) from the property line; 10 feet (3048 mm) from operable openings into the building; 6 feet (1829 mm) from exterior walls and roofs; 30

feet (9144 mm) from combustible walls and operable openings into the building which are in the direction of the exhaust discharge; 10 feet (3048 mm) above adjoining grade.

2. **For other product-conveying outlets:** 10 feet (3048 mm) from property lines; 3 feet (914 mm) from exterior walls and roofs; 10 feet (3048 mm) from operable openings into the building; 10 feet (3048 mm) above adjoining grade.

3. **For environmental air exhaust other than enclosed parking garage and transformer vault exhaust:** 3 feet (914 mm) from property lines, 3 feet (914 mm) from operable openings into buildings for all occupancies other that Group U, and 10 feet (3048 mm) from mechanical air intakes. Such exhaust shall not be considered hazardous or noxious.

EXCEPTIONS:
1. The separation between an air intake and exhaust outlet on a single listed package HVAC unit.
2. Exhaust from environmental air systems other than garages may be discharged into an open parking garage.
3. Except for Group I occupancies, where ventilation system design circumstances require building HVAC air to be relieved, such as during economizer operation, such air may be relieved into an open or enclosed parking garage within the same building.

4. Exhaust outlets serving structures in flood hazard areas shall be installed at or above the design flood level.

5. For enclosed parking garage exhaust system outlets and transformer vault exhaust system outlets: 10 feet (3048 mm) from property lines which separate one lot from another; 10 feet (3048 mm) from operable openings into buildings; 10 feet (3048 mm) above adjoining grade.

6. For elevator machinery rooms in enclosed or open parking garages: Exhaust outlets may discharge air directly into the parking garage.

7. For specific systems see the following sections:

7.1 Clothes dryer exhaust, Section 504.4.

7.2 Kitchen hoods and other kitchen exhaust equipment, Sections 506.3, 506.4 and 506.5.

7.3 Dust stock and refuse conveying systems, Section 511.

7.4 Subslab soil exhaust systems, Section 512.4.

7.5 Smoke control systems, Section 513.10.3.

7.6 Refrigerant discharge, Section 1105.7.

7.7 Machinery room discharge, Section 1105.6.1.

[Statutory Authority: RCW 19.27.190, 19.27.074, 19.27.031 and chapters 19.27 and 34.05 RCW. 10-03-099, § 51-52-0501, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.190, 19.27.020, and chapters 19.27 and 34.05 RCW. 07-01-092, § 51-52-0501, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.020, 19.27.031, 19.27.074 and chapters 19.27 and 34.05 RCW. 05-01-015, § 51-52-0501, filed 12/2/04, effective 7/1/05.]

WAC 51-52-0504 Section 504—Clothes dryer exhaust.

504.6.4.1 Specified length. The maximum length of the exhaust duct shall be 35 feet (10668 mm) from the connection to the transition duct from the dryer to the outlet terminal. Where fittings are used, the maximum length of the exhaust duct shall be reduced in accordance with Table 504.6.4.1.

The maximum length of the duct may be increased in an engineered exhaust system when a listed and labeled exhaust booster fan is installed in accordance with the manufacturer's installation instructions.

[Statutory Authority: RCW 19.27.190, 19.27.074, 19.27.031 and chapters 19.27 and 34.05 RCW. 10-03-099, § 51-52-0504, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.190, 19.27.020, and chapters 19.27 and 34.05 RCW. 07-01-092, § 51-52-0504, filed 12/19/06, effective 7/1/07.]

WAC 51-52-0505 Section 505—Domestic kitchen exhaust equipment.

505.1 Domestic systems. Where domestic range hoods and domestic appliances equipped with downdraft exhaust are located within dwelling units, such hoods and appliances shall discharge to the outdoors through sheet metal ducts constructed of galvanized steel, stainless steel, aluminum or copper. Such ducts shall have smooth inner walls and shall be air tight and equipped with a backdraft damper. Domestic range hood duct systems shall not be combined with other environmental air exhaust systems.

Listed and labeled exhaust booster fans shall be permitted when installed in accordance with the manufacturer's installation instructions.

EXCEPTIONS:
1. Where installed in accordance with the manufacturer's installation instructions and where mechanical ventilation is otherwise provided in accordance with Chapter 4, listed and labeled ductless range hoods shall not be required to discharge to the outdoors.
2. Ducts for domestic kitchen cooking appliances equipped with downdraft exhaust systems shall be permitted to be constructed of Schedule 40 PVC pipe and fittings provided that the installation complies with all of the following:
2.1. The duct shall be installed under a concrete slab poured on grade.
2.2. The underfloor trench in which the duct is installed shall be completely backfilled with sand or gravel.
2.3. The PVC duct shall extend not more than 1 inch (25 mm) above the indoor concrete floor surface.
2.4. The PVC duct shall extend not more than 1 inch (25 mm) above grade outside of the building.
2.5. The PVC ducts shall be solvent cemented.

[Statutory Authority: RCW 19.27.190, 19.27.074, 19.27.031 and chapters 19.27 and 34.05 RCW. 10-03-099, § 51-52-0505, filed 1/20/10, effective 7/1/10.]

WAC 51-52-0506 Section 506—Commercial kitchen hood ventilation system ducts and exhaust equipment.

506.3.9 Grease duct cleanout location, spacing and installation.

506.3.9.1 Grease duct horizontal cleanout. Cleanouts located on horizontal sections of ducts shall be spaced not more than 20 feet (6096 mm) apart. The cleanouts shall be located on the side of the duct with the opening not less than 1 1/2 inches (38 mm) above the bottom of the duct, and not less than 1 inch (25 mm) below the top of the duct. The opening minimum dimensions shall be 12 inches (305 mm) on each side. Where the dimensions of the side of the duct prohibit the cleanout installation prescribed herein, the openings shall be on the top of the duct or the bottom of the duct. Where located on the top of the duct, the opening edges shall be a minimum of 1 inch (25 mm) from the edges of the duct. Where located in the bottom of the duct, cleanout openings shall be designed to provide internal damming around the opening, shall be provided with gasketing to preclude grease leakage, shall provide for drainage of grease down the duct around the dam and shall be approved for the application. Where the dimensions of the sides, top or bottom of the duct

preclude the installation of the prescribed minimum-size cleanout opening, the cleanout shall be located on the duct face that affords the largest opening dimension and shall be installed with the opening edges at the prescribed distances from the duct edges as previously set forth in this section.

506.3.9.2 Grease duct vertical cleanouts. Where ducts pass vertically through floors, cleanouts shall be provided. A minimum of one cleanout shall be provided on each floor. Cleanout openings shall be not less than 1 1/2 inches (38 mm) from all outside edges of the duct or welded seams.

[Statutory Authority: RCW 19.27.190, 19.27.074, 19.27.031 and chapters 19.27 and 34.05 RCW. 10-03-099, § 51-52-0506, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.190, 19.27.020, and chapters 19.27 and 34.05 RCW. 07-01-092, § 51-52-0506, filed 12/19/06, effective 7/1/07.]

WAC 51-52-0507 Section 507—Commercial kitchen hoods.

507.2.1 Type I hoods. Type I hoods shall be installed where cooking appliances produce grease or smoke. Type I hoods shall be installed over medium-duty, heavy-duty and extra-heavy-duty cooking appliances. Type I hoods shall be installed over light-duty cooking appliances that produce grease or smoke.

EXCEPTION: A Type I hood shall not be required in an R-2 type occupancy with not more than 16 residents.

[Statutory Authority: RCW 19.27.190, 19.27.074, 19.27.031 and chapters 19.27 and 34.05 RCW. 10-03-099, § 51-52-0507, filed 1/20/10, effective 7/1/10.]

WAC 51-52-0601 Section 601—General.

601.2 Air movement in egress elements. Corridors shall not serve as supply, return, exhaust, relief or ventilation air ducts.

EXCEPTIONS:
1. Use of a corridor as a source of makeup air for exhaust systems in rooms that open directly onto such corridors, including toilet rooms, bathrooms, dressing rooms, smoking lounges and janitor closets, shall be permitted provided that each such corridor is directly supplied with outdoor air at a rate greater than the rate of makeup air taken from the corridor.
2. Where located within a dwelling unit, the use of corridors for conveying return air shall not be prohibited.
3. Where located within tenant spaces of one thousand square feet (93 m^2) or less in area, utilization of corridors for conveying return air is permitted.
4. Incidental air movement from pressurized rooms within health care facilities, provided that the corridor is not the primary source of supply or return to the room.
5. Where such air is part of an engineered smoke control system.
6. Air supplied to corridors serving residential occupancies shall not be considered as providing ventilation air to the dwelling units subject to the following:
6.1 The air supplied to the corridor is one hundred percent outside air; and
6.2 The units served by the corridor have conforming ventilation air independent of the air supplied to the corridor; and
6.3 For other than high-rise buildings, the supply fan will automatically shut off upon activation of corridor smoke detectors which shall be spaced at no more than thirty feet (9,144 mm) on center along the corridor; or
6.4 For high-rise buildings, corridor smoke detector activation will close required smoke/fire dampers at the supply inlet to the corridor at the floor receiving the alarm.

[Statutory Authority: RCW 19.27.190, 19.27.074, 19.27.031 and chapters 19.27 and 34.05 RCW. 10-03-099, § 51-52-0601, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.190, 19.27.020, and chapters 19.27 and 34.05 RCW. 07-01-092, § 51-52-0601, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-104, § 51-52-0601, filed 12/17/03, effective 7/1/04.]

WAC 51-52-0603 Section 603—Duct construction and installation.

603.5.1 Gypsum ducts. The use of gypsum boards to form air shafts (ducts) shall be limited to return air systems where the air temperatures do not exceed 125ºF (52ºC) and the gypsum board surface temperature is maintained above the airstream dew-point temperature. Air ducts formed by gypsum boards shall not be incorporated in air-handling systems utilizing evaporative coolers.

EXCEPTION: In other than Group I-2 occupancies, gypsum boards may be used for ducts that are only used for stairwell or elevator pressurization supply air. The gypsum duct shall not attach directly to the equipment.

[Statutory Authority: RCW 19.27.190, 19.27.074, 19.27.031 and chapters 19.27 and 34.05 RCW. 10-03-099, § 51-52-0603, filed 1/20/10, effective 7/1/10.]

WAC 51-52-0606 Section 606—Smoke detection systems control.

606.2.2 Common supply and return air systems. Where multiple air-handling systems share common supply or return air ducts or plenums with a combined design capacity greater than 2,000 cfm (0.9 m^3/s), the return air system shall be provided with smoke detectors in accordance with Section 606.2.1.

EXCEPTION: Individual smoke detectors shall not be required for each fan-powered terminal unit, provided that such units do not have an individual design capacity greater than 2,000 cfm (0.9 m^3/s) and will be shut down by activation of one of the following:
1. Smoke detectors required by Sections 606.2.1 and 606.2.3.
2. An approved area smoke detector system located in the return air plenum serving such units.
3. An area smoke detector system as prescribed in the exception to Section 606.2.1.

In all cases, the smoke detectors shall comply with Sections 606.4 and 606.4.1.

The shut down of fan-powered terminal units may be performed by a building automation system upon activation of smoke detection as described in Section 606.2.2, Exception Items 1, 2, or 3. The building automation system is not required to be listed as a smoke control system and is not required to comply with UL Standard 864: Standard for Control Units and Accessories for Fire Alarm Systems.

[Statutory Authority: RCW 19.27.190, 19.27.074, 19.27.031 and chapters 19.27 and 34.05 RCW. 10-03-099, § 51-52-0606, filed 1/20/10, effective 7/1/10.]

WAC 51-52-1000 Chapter 10—Boilers, water heaters and pressure vessels.

SECTIONS 1003 THROUGH 1011, are not adopted.

Boilers and Unfired Pressure Vessels are regulated by chapter 70.79 RCW.

[Statutory Authority: RCW 19.27.190, 19.27.074, 19.27.031 and chapters 19.27 and 34.05 RCW. 10-03-099, § 51-52-1000, filed 1/20/10, effective

7/1/10. Statutory Authority: RCW 19.27.190, 19.27.020, and chapters 19.27 and 34.05 RCW. 07-01-092, § 51-52-1000, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-104, § 51-52-1000, filed 12/17/03, effective 7/1/04.]

WAC 51-52-1500 Chapter 15—Referenced standards. The following referenced standards are added to Chapter 15.

ASHRAE

62.2-2007 Ventilation and Acceptable Indoor Air Quality in Low-Rise Residential Buildings

[Statutory Authority: RCW 19.27.190, 19.27.074, 19.27.031 and chapters 19.27 and 34.05 RCW. 10-03-099, § 51-52-1500, filed 1/20/10, effective 7/1/10.]

WAC 51-52-21101 Section 101—General.

101.2 Scope. This code shall apply to the installation of fuel gas piping systems, fuel gas utilization equipment, gaseous hydrogen systems and regulated accessories in accordance with Section 101.2.1 through 101.2.5.

EXCEPTIONS: 1. Detached one- and two-family dwellings and multiple single-family dwellings (townhouses) not more than three stories high with separate means of egress and their accessory structures shall comply with the *International Residential Code*.

2. The standards for liquefied petroleum gas installations shall be the 2008 Edition of NFPA 58 (Liquefied Petroleum Gas Code) and the 2009 Edition of ANSI Z223.1/NFPA 54 (National Fuel Gas Code).

[Statutory Authority: RCW 19.27.190, 19.27.074, 19.27.031 and chapters 19.27 and 34.05 RCW. 10-03-099, § 51-52-21101, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.190, 19.27.020, and chapters 19.27 and 34.05 RCW. 07-01-092, § 51-52-21101, filed 12/19/06, effective 7/1/07.]

Chapter 51-54 WAC

STATE BUILDING CODE ADOPTION AND AMENDMENT OF THE 2009 EDITION OF THE INTERNATIONAL FIRE CODE

(Formerly chapters 51-44 and 51-45 WAC)

WAC

51-54-003 International Fire Code.
51-54-007 Exceptions.
51-54-008 Implementation.
51-54-0100 Chapter 1—Administration.
51-54-0200 Chapter 2—Definitions.
51-54-0300 Chapter 3—General precautions against fire.
51-54-0400 Chapter 4—Emergency planning and preparedness.
51-54-0500 Chapter 5—Fire service features.
51-54-0600 Chapter 6—Building services and systems.
51-54-0800 Chapter 8—Interior finish, decorative materials and furnishings.
51-54-0900 Chapter 9—Fire protection systems.
51-54-1000 Chapter 10—Means of egress.
51-54-1100 Aircraft-fueling vehicles.
51-54-2200 Chapter 22—Motor fuel-dispensing facilities and repair garages.
51-54-3300 Chapter 33—Explosives and fireworks.
51-54-3400 Chapter 34—Flammable and combustible liquids.
51-54-3800 Chapter 38—Liquefied petroleum gases.
51-54-4500 Chapter 45—Marinas.
51-54-4600 Chapter 46—Existing buildings.
51-54-4700 Chapter 47—Referenced standards.
51-54-4800 Appendix K—Wildland and Urban Interface Code.

DISPOSITION OF SECTIONS FORMERLY CODIFIED IN THIS CHAPTER

51-54-1007 Section 1007—Accessible means of egress. [Statutory Authority: RCW 19.27.031 and 19.27.074. 10-03-100, § 51-54-1007, filed 1/20/10, effective 7/1/10.] Repealed by 10-24-059, filed 11/29/10, effective 7/1/11. Statutory Authority: Chapter 19.27 RCW.

51-54-1008 Section 1008—Doors, gates and turnstiles. [Statutory Authority: RCW 19.27.031 and 19.27.074. 10-03-100, § 51-54-1008, filed 1/20/10, effective 7/1/10.] Repealed by 10-24-059, filed 11/29/10, effective 7/1/11. Statutory Authority: Chapter 19.27 RCW.

51-54-1009 Section 1009—Stairways and handrails. [Statutory Authority: RCW 19.27.031 and 19.27.074. 10-03-100, § 51-54-1009, filed 1/20/10, effective 7/1/10.] Repealed by 10-24-059, filed 11/29/10, effective 7/1/11. Statutory Authority: Chapter 19.27 RCW.

51-54-1010 Section 1010—Ramps. [Statutory Authority: RCW 19.27.031 and 19.27.074. 10-03-100, § 51-54-1010, filed 1/20/10, effective 7/1/10.] Repealed by 10-24-059, filed 11/29/10, effective 7/1/11. Statutory Authority: Chapter 19.27 RCW.

51-54-1014 Exit access. [Statutory Authority: RCW 19.27.031 and 19.27.074. 10-03-100, § 51-54-1014, filed 1/20/10, effective 7/1/10.] Repealed by 10-24-059, filed 11/29/10, effective 7/1/11. Statutory Authority: Chapter 19.27 RCW.

51-54-1015 Reserved. [Statutory Authority: RCW 19.27.031 and 19.27.074. 10-03-100, § 51-54-1015, filed 1/20/10, effective 7/1/10.] Repealed by 10-24-059, filed 11/29/10, effective 7/1/11. Statutory Authority: Chapter 19.27 RCW.

51-54-1017 Reserved. [Statutory Authority: RCW 19.27.031 and 19.27.074. 10-03-100, § 51-54-1017, filed 1/20/10, effective 7/1/10.] Repealed by 10-24-059, filed 11/29/10, effective 7/1/11. Statutory Authority: Chapter 19.27 RCW.

51-54-1018 Section 1018—Corridors. [Statutory Authority: RCW 19.27.031 and 19.27.074. 10-03-100, § 51-54-1018, filed 1/20/10, effective 7/1/10.] Repealed by 10-24-059, filed 11/29/10, effective 7/1/11. Statutory Authority: Chapter 19.27 RCW.

51-54-1019 Reserved. [Statutory Authority: RCW 19.27.031 and 19.27.074. 10-03-100, § 51-54-1019, filed 1/20/10, effective 7/1/10.] Repealed by 10-24-059, filed 11/29/10, effective 7/1/11. Statutory Authority: Chapter 19.27 RCW.

WAC 51-54-003 International Fire Code. The 2009 edition of the International Fire Code, published by the International Code Council is hereby adopted by reference with the following additions, deletions, and exceptions.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 10-03-100, § 51-54-003, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.031, 19.27.074, and chapters 19.27 and 34.05 RCW. 07-01-093, § 51-54-003, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-105, § 51-54-003, filed 12/17/03, effective 7/1/04.]

WAC 51-54-007 Exceptions. The exceptions and amendments to the International Fire Code contained in the provisions of chapter 19.27 RCW shall apply in case of conflict with any of the provisions of these rules.

Codes referenced which are not adopted through RCW 19.27.031 or chapter 19.27A RCW shall not apply unless specifically adopted by the authority having jurisdiction. The 2009 International Wildland Urban Interface Code is included in this Code as Section 4800 with amendments found in Appendix Chapter K.

The provisions of this code do not apply to temporary growing structures used solely for the commercial production of horticultural plants including ornamental plants, flowers, vegetables, and fruits. "Temporary growing structure" means a structure that has the sides and roof covered with polyethyl-

ene, polyvinyl, or similar flexible synthetic material and is used to provide plants with either frost protection or increased heat retention. A temporary growing structure is not considered a building for purposes of this code.

The provisions of this code do not apply to the construction, alteration, or repair of temporary worker housing except as provided by rule adopted under chapter 70.114A RCW or chapter 37, Laws of 1998 (2SSB 6168). "Temporary worker housing" means a place, area, or piece of land where sleeping places or housing sites are provided by an employer for his or her employees or by another person, including a temporary worker housing operator, who is providing such accommodations for employees, for temporary, seasonal occupancy, and includes "labor camps" under RCW 70.54.110.

The manufacture, storage, handling, sale and use of fireworks shall be governed by chapter 70.77 RCW and by chapter 212-17 WAC and local ordinances consistent with chapter 212-17 WAC.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 10-03-100, § 51-54-007, filed 1/20/10, effective 7/1/10; 04-01-105, § 51-54-007, filed 12/17/03, effective 7/1/04.]

WAC 51-54-008 Implementation. The International Fire Code adopted by chapter 51-54 WAC shall become effective in all counties and cities of this state on July 1, 2010.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 10-03-100, § 51-54-008, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.031, 19.27.074, and chapters 19.27 and 34.05 RCW. 07-01-093, § 51-54-008, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-105, § 51-54-008, filed 12/17/03, effective 7/1/04.]

WAC 51-54-0100 Chapter 1—Administration.

101.2.1 Appendices. Provisions in the appendices shall not apply unless specifically adopted. The State Building Code Council has determined that a local ordinance adopting Appendix K Wildland Urban Interface Code may be adopted by any local government upon notification of the Council.

105.1.1 Permits required. Any property owner or authorized agent who intends to conduct an operation or business, or install or modify systems and equipment, which is regulated by this code, or to cause any such work to be done shall first make application to the fire code official and obtain the required permit.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 10-03-100, § 51-54-0100, filed 1/20/10, effective 7/1/10; 04-01-105, § 51-54-0100, filed 12/17/03, effective 7/1/04.]

WAC 51-54-0200 Chapter 2—Definitions.

SECTION 202 GENERAL DEFINITIONS.

ADULT FAMILY HOME means a dwelling in which a person or persons provide personal care, special care, room and board to more than one but not more than six adults who are not related by blood or marriage to the person or persons providing the services.

ALERT SIGNAL. See Section 402.1

ALERT SYSTEM. See Section 402.1

CHILD DAY CARE, shall, for the purposes of these regulations, mean the care of children during any period of a 24-hour day.

COVERED BOAT MOORAGE. See Section 4502.1

ELECTRICAL CODE is the National Electrical Code, promulgated by the National Fire Protection Association, as adopted by rule or local ordinance under the authority of chapter 19.28 RCW.

FAMILY CHILD DAY CARE HOME is a child day care facility, licensed by the state, located in the dwelling of the person or persons under whose direct care and supervision the child is placed, for the care of twelve or fewer children, including children who reside at the home.

FULL LOCKDOWN. See Section 402.1

GRAVITY - OPERATED DROP OUT VENTS. See Section 4502.1

HOSPICE CARE CENTERS. A building or portion thereof used on a 24-hour basis for the provision of hospice services to terminally ill inpatients.

MODIFIED LOCKDOWN. See Section 402.1

NIGHTCLUB. An A-2 Occupancy use under the 2006 International Building Code in which the aggregate area of concentrated use of unfixed chairs and standing space that is specifically designated and primarily used for dancing or viewing performers exceeds three hundred fifty square feet, excluding adjacent lobby areas. "Nightclub" does not include theaters with fixed seating, banquet halls, or lodge halls.

OCCUPANCY CLASSIFICATION. For the purposes of this code, certain occupancies are defined as follows:

EDUCATIONAL GROUP E. Educational Group E Occupancy includes, among others, the use of a building or structure, or a portion thereof, by six or more persons at any one time for educational purposes through the 12th grade. Religious educational rooms and religious auditoriums, which are accessory to places of religious worship in accordance with Section 508.3.1 of the International Building Code and have occupant loads of less than 100, shall be classified as Group A-3 Occupancies.

Day Care. The use of a building or structure, or portion thereof, for educational, supervision or personal care services for more than five children older than 2 1/2 years of age, shall be classified as an E Occupancy.

EXCEPTION: Family child day care homes licensed by the state of Washington for the care of twelve or fewer children shall be classified as Group R3.

INSTITUTIONAL GROUP I. Institutional Group I Occupancy includes, among others, the use of a building or structure, or a portion thereof, in which people are cared for or live in a supervised environment, having physical limitations because of health or age, are harbored for medical treatment or other care or treatment, or in which people are detained for penal or correctional purposes or in which the liberty of the occupants is restricted. Institutional occupancies shall be classified as Group I-1, I-2, I-3 or I-4.

Group I-1. This occupancy shall include buildings, structures or parts thereof housing more than 16 persons, on a 24-hour basis, who because of age, mental disability or other reasons, live in a supervised residential environment that provides personal care services. The occupants are capable of

responding to an emergency situation without physical assistance from staff. This group shall include, but not be limited to, the following:

Alcohol and drug centers
Assisted living facilities
Congregate care facilities
Convalescent facilities
Group homes
Halfway houses
Residential board and care facilities
Social rehabilitation facilities

A facility such as the above with five or fewer persons and adult family homes licensed by Washington state shall be classified as a Group R-3 or shall comply with the *International Residential Code* in accordance with Section 101.2 of the International Building Code.

A facility such as the above, providing licensed care to clients in one of the categories listed in IBC Section 310.1 licensed by Washington state shall be classified as Group R-2.

Group I-2. This occupancy shall include buildings and structures used for medical, surgical, psychiatric, nursing or custodial care for persons who are not capable of self-preservation. This group shall include, but not be limited to, the following:

Child care facilities
Detoxification facilities
Hospice care centers
Hospitals
Mental hospitals
Nursing homes

A facility such as the above providing licensed care to clients in one of the categories listed in IBC Section 310.1 licensed by Washington state shall be classified as Group R-2.

Group I-3. (Remains as printed in the IFC.)

Group I-4. Day care facilities. This group shall include buildings and structures occupied by persons of any age who receive custodial care for less than 24 hours by individuals other than parents or guardians, relatives by blood, marriage, or adoption, and in a place other than the home of the person cared for. A facility such as the above with five or fewer persons shall be classified as Group R-3 or shall comply with the *International Residential Code* in accordance with Section 101.2 of the International Building Code. Places of worship during religious functions are not included.

Adult care facility. A facility that provides accommodations for less than 24 hours for more than five unrelated adults and provides supervision and personal care services shall be classified as Group I-4.

EXCEPTION: Where the occupants are capable of responding to an emergency situation without physical assistance from the staff, the facility shall be classified as Group R-3.

Child care facility. Child care facilities that provide supervision and personal care on a less than 24-hour basis for more than five children 2 1/2 years of age or less shall be classified as Group I-4.

EXCEPTIONS: 1. A child day care facility that provides care for more than five but no more than 100 children 2 1/2 years or less of age, where the rooms in which the children are cared for are located on a level of exit discharge serving such rooms and each of these child care rooms has an exit door directly to the exterior, shall be classified as Group E.
2. Family child day care homes licensed by Washington state for the care of 12 or fewer children shall be classified as Group R3.

RESIDENTIAL GROUP R. Residential Group R includes, among others, the use of a building or structure, or a portion thereof, for sleeping purposes when not classified as an Institutional Group I or when not regulated by the International Residential Code in accordance with Section 101.2 of the International Building Code. Residential occupancies shall include the following:

R-1 Residential occupancies containing sleeping units where the occupants are primarily transient in nature, including:

Boarding houses (transient)
Hotels (transient)
Motels (transient)

Congregate living facilities (transient) with 10 or fewer occupants are permitted to comply with the construction requirements for Group R-3.

R-2 Residential occupancies containing sleeping units or more than two dwelling units where the occupants are primarily permanent in nature, including:

Apartment houses
Boarding houses (nontransient)
Boarding homes as licensed by Washington state under chapter 388-78A WAC
Convents
Dormitories
Fraternities and sororities
Hotels (nontransient)
Live/work units
Motels (nontransient)
Monasteries
Residential treatment facilities as licensed by Washington state under chapter 246-337 WAC
Vacation timeshare properties

Congregate living facilities with sixteen or fewer occupants are permitted to comply with the construction requirements for Group R-3.

R-3 Residential occupancies where the occupants are primarily permanent in nature and not classified as Group R-1, R-2, R-4 or I, including: Buildings that do not contain more than two dwelling units. Adult care facilities that provide accommodations for five or fewer persons of any age for less than 24 hours. Child care facilities that provide accommodations for five or fewer persons of any age for less than 24 hours. Congregate living facilities with sixteen or fewer persons. Adult care within a single-family home, adult family homes and family child day care homes are permitted to comply with the *International Residential Code*.

Foster family care homes licensed by Washington state are permitted to comply with the *International Residential Code*, as an accessory use to a dwelling, for six or fewer children including those of the resident family.

R-4 classification is not adopted. Any reference in this code to R-4 does not apply.

RECALL SIGNAL. See Section 402.1

SHELTER-IN-PLACE. See Section 402.1

[Statutory Authority: RCW 19.27.031 and 19.27.074. 10-03-100, § 51-54-0200, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.190, 19.27.020, and chapters 19.27 and 34.05 RCW. 08-01-101, § 51-54-0200, filed 12/18/07, effective 4/1/08. Statutory Authority: RCW 19.27.031, 19.27.074, and chapters 19.27 and 34.05 RCW. 07-01-093, § 51-54-0200, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.020, 19.27.031, 19.27.074 and chapters 19.27 and 34.05 RCW. 05-24-071, § 51-54-0200, filed 12/5/05, effective 7/1/06. Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-105, § 51-54-0200, filed 12/17/03, effective 7/1/04.]

WAC 51-54-0300 Chapter 3—General precautions against fire.

307.2.1 Authorization. Where required by state or local law or regulations, open burning shall only be permitted with prior approval from the state or local air and water quality management authority, provided that all conditions specified in the authorization are followed. See also chapter 173-425 WAC.

307.4.2 Recreational fires. Recreational fires shall not be conducted within 25 feet of a structure or combustible material. Conditions which could cause a fire to spread within 25 feet of a structure shall be eliminated prior to ignition. See also chapter 173-425 WAC.

308.1.4 Open-flame cooking devices. This section is not adopted.

308.1.7 Religious ceremonies. Participants in religious ceremonies shall not be precluded from carrying hand-held candles. See RCW 19.27.031(3).

308.1.9 Aisles and exits. Candles shall be prohibited in areas where occupants stand, or in an aisle or exit.

EXCEPTION: Candles used in religious ceremonies.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 10-03-100, § 51-54-0300, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.031, 19.27.074, and chapters 19.27 and 34.05 RCW. 07-01-093, § 51-54-0300, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.020, 19.27.031, 19.27.074 and chapters 19.27 and 34.05 RCW. 05-01-016, § 51-54-0300, filed 12/2/04, effective 7/1/05. Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-105, § 51-54-0300, filed 12/17/03, effective 7/1/04.]

WAC 51-54-0400 Chapter 4—Emergency planning and preparedness.

SECTION 401 GENERAL

401.1 Scope. Reporting of emergencies, coordination with emergency response forces, emergency plans and procedures for managing or responding to emergencies shall comply with the provisions of this section.

EXCEPTION: Firms that have approved on-premises firefighting organizations and that are in compliance with approved procedures for fire reporting.

401.2 Approval. Where required by the fire code official, fire safety plans, emergency procedures and employee training programs shall be approved.

401.3 Emergency responder notification. Notification of emergency responders shall be in accordance with Sections 401.3.1 through 401.3.3.

401.3.1 Fire events. In the event an unwanted fire occurs on a property, the owner or occupant shall immediately report such condition to the fire department.

401.3.2 Alarm activations. Upon activation of a fire alarm signal, employees or staff shall immediately notify the fire department.

401.3.3 Delayed notification. A person shall not, by verbal or written directive, require any delay in the reporting of a fire to the fire department.

401.4 Required plan implementation. In the event an unwanted fire is detected in a building or a fire alarm activates, the emergency plan shall be implemented.

401.5 Making false report. A person shall not give, signal or transmit a false alarm.

401.6 Emergency evacuation drills. The sounding of a fire alarm signal and the carrying out of an emergency evacuation drill in accordance with the provisions of Section 405 shall be allowed.

401.7 Unplanned evacuation. Evacuations made necessary by the unplanned activation of a fire alarm system or by any other emergency shall not be substituted for a required evacuation drill.

401.8 Interference with fire department operations. It shall be unlawful to interfere with, attempt to interfere with, conspire to interfere with, obstruct or restrict the mobility of or block the path of travel of a fire department emergency vehicle in any way, or to interfere with, attempt to interfere with, conspire to interfere with, obstruct or hamper any fire department operation.

SECTION 402 DEFINITIONS

402.1 Definition. The following words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

ALARM SIGNAL. See Section 902.1.

ALERT SIGNAL. A distinctive signal indicating the need for trained personnel and occupants to initiate a specific action, such as lockdown or shelter-in-place.

ALERT SYSTEM. Approved devices, equipment and systems or combinations of systems used to transmit or broadcast an alert signal.

EMERGENCY DRILL. An exercise performed to train staff and occupants and to evaluate their efficiency and effectiveness in carrying out emergency procedures.

LOCKDOWN. An emergency situation, in other than a Group I-3 occupancy, requiring that the occupants be sheltered and secured in place within a building when normal evacuation would put occupants at risk.

FULL LOCKDOWN. Occupants remain out of sight and as quiet as possible, with only limited authorized entry, exit, or movement within the building. Occupants in corridors, common areas, or unsecured areas move quickly to the nearest secured area.

MODIFIED LOCKDOWN. Occupants of a facility are isolated from potential outside threats by remaining within a building with exterior doors and other exits secured, and that entry and exit from the building is limited to that which is authorized. During a modified lockdown, interior movement and other activities within the building may be allowed or restricted in accordance to the lockdown plan.

SHELTER-IN-PLACE. An emergency response used to minimize exposure of facility occupants to chemical or environmental hazards by taking refuge in predetermined interior rooms or areas where actions are taken to isolate the interior environment from the exterior hazard.

RECALL SIGNAL. An electrically or mechanically operated signal used to recall occupants after an emergency drill or to terminate a lockdown or shelter-in-place event that shall be distinct from any alarm or alert signal used to initiate an emergency plan, or other signals.

SECTION 403 PUBLIC ASSEMBLAGES AND EVENTS

403.1 Fire watch personnel. When, in the opinion of the fire code official, it is essential for public safety in a place of assembly or any other place where people congregate, because of the number of persons, or the nature of the performance, exhibition, display, contest or activity, the owner, agent or lessee shall provide one or more fire watch personnel, as required and approved, to remain on duty during the times such places are open to the public, or when such activity is being conducted.

403.1.1 Duties. Fire watch personnel shall keep diligent watch for fires, obstructions to means of egress and other hazards during the time such place is open to the public or such activity is being conducted and take prompt measures for remediation of hazards, extinguishment of fires that occur and assist in the evacuation of the public from the structures.

403.2 Public safety plan. In other than Group A or E occupancies, where the fire code official determines that an indoor or outdoor gathering of persons has an adverse impact on public safety through diminished access to buildings, structures, fire hydrants and fire apparatus access roads or where such gatherings adversely affect public safety services of any kind, the fire code official shall have the authority to order the development of, or prescribe a plan for, the provision of an approved level of public safety.

403.2.1 Contents. The public safety plan, where required by Section 403.2, shall address such items as emergency vehicle ingress and egress, fire protection, emergency medical services, public assembly areas and the directing of both attendees and vehicles (including the parking of vehicles), vendor and food concession distribution, and the need for the presence of law enforcement, and fire and emergency medical services personnel at the event.

403.3 Crowd managers. Trained crowd managers shall be provided for facilities or events where more than 1,000 persons congregate. The minimum number of crowd managers shall be established at a ratio of one crowd manager to every 250 persons. Where approved by the fire code official, the ratio of crowd managers shall be permitted to be reduced where the facility is equipped throughout with an approved automatic sprinkler system or based upon the nature of the event.

SECTION 404 FIRE SAFETY AND EMERGENCY PLANS

404.1 General. Fire safety, evacuation, shelter-in-place and lockdown plans and associated drills shall comply with the requirements of Sections 404.2 through 404.5.1.

404.2 Fire safety and evacuation plans. Fire safety and evacuation plans shall comply with the requirements of Sections 404.2.1 through 404.2.2.2.

404.2.1 Where required. An approved fire safety and evacuation plan shall be prepared and maintained for the following occupancies and buildings.

1. Group A having an occupant load of 100 or more.
2. Group B buildings having an occupant load of 500 or more persons or more than 100 persons above or below the lowest level of exit discharge.
3. Group E.
4. Group F buildings having an occupant load of 500 or more persons or more than 100 persons above or below the lowest level of exit discharge.
5. Group H.
6. Group I.
7. Group R-1.
8. Group R-2 college and university buildings. Boarding homes, group homes, and residential treatment facilities licensed by the state of Washington.
9. High-rise buildings.
10. Group M buildings having an occupant load of 500 or more persons or more than 100 persons above or below the lowest level of exit discharge.
11. Covered malls exceeding 50,000 square feet (4645 m^2) in aggregate floor area.
12. Underground buildings.
13. Buildings with an atrium and having an occupancy in Group A, E or M.

404.2.2 Contents. Fire evacuation and safety plan contents shall be in accordance with Sections 404.2.2.1 and 404.2.2.2.

404.2.2.1 Fire evacuation plans. Fire evacuation plans shall include the following:

1. Emergency egress or escape routes and whether evacuation of the building is to be complete or, where approved, by selected floors or areas only.
2. Procedures for employees who must remain to operate critical equipment before evacuating.
3. Procedures for assisted rescue for persons unable to use the general means of egress unassisted.
4. Procedures for accounting for employees and occupants after evacuation has been completed.
5. Identification and assignment of personnel responsible for rescue or emergency medical aid.
6. The preferred and any alternative means of notifying occupants of a fire.
7. The preferred and any alternative means of reporting fires and other emergencies to the fire department or designated emergency response organization.
8. Identification and assignment of personnel who can be contacted for further information or explanation of duties under the plan.

9. A description of the emergency voice/alarm communication system alert tone and preprogrammed voice messages, where provided.

404.2.2.2 Fire safety plans. Fire safety plans shall include the following:

1. The procedure for reporting a fire or other emergency.
2. The life safety strategy and procedures for notifying, relocating or evacuating occupants, including occupants who need assistance.
3. Site plans indicating the following:
3.1. The occupancy assembly point.
3.2. The locations of fire hydrants.
3.3. The normal routes of fire department vehicle access.
4. Floor plans identifying the locations of the following:
4.1. Exits.
4.2. Primary evacuation routes.
4.3. Secondary evacuation routes.
4.4. Accessible egress routes.
4.5. Areas of refuge.
4.6. Exterior areas for assisted rescue.
4.7. Manual fire alarm boxes.
4.8. Portable fire extinguishers.
4.9. Occupant-use hose stations.
4.10. Fire alarm annunciators and controls.
5. A list of major fire hazards associated with the normal use and occupancy of the premises, including maintenance and housekeeping procedures.
6. Identification and assignment of personnel responsible for maintenance of systems and equipment installed to prevent or control fires.
7. Identification and assignment of personnel responsible for maintenance, housekeeping and controlling fuel hazard sources.

404.3 Shelter-in-place and lockdown plans. Shelter-in-place and lockdown plans shall comply with the requirements of Sections 404.3.1 through 404.3.3.

404.3.1 Where required. A shelter-in-place and lockdown plan shall be prepared and maintained for all Group E occupancies.

EXCEPTION: Day cares not colocated on a Group E campus.

404.3.2 Shelter-in-place plan contents. Shelter-in-place plans shall include the following:

1. Identification of the procedures of initiating the shelter-in-place plan throughout the facility or campus.
2. Identification of prearranged alert and recall signals to notify all occupants.
3. Identification of procedures for reporting the facility is sheltering-in-place to the local emergency dispatch center.
4. A means of two-way communication between a central location and each secure area, and consideration for maintaining means of communication in absence of primary power.
5. Identification of protective security measures.
6. Location of emergency supplies.
7. Accountability procedures for staff to report the presence or absence of occupants.
8. Identification of crisis response team members in accordance with the National Incident Management System.
9. Actions to be taken in the event of a fire or medical emergency while sheltering-in-place.

404.3.3 Lockdown plan contents. Lockdown plans shall include the following:

1. Identification of the procedures of initiating the lockdown plan throughout the facility or campus.
2. Identification of prearranged alert and recall signals to notify all occupants.
3. Identification of procedures for access to the facility for emergency responders.
4. Identification of procedures for reporting the facility is in lockdown to the local emergency dispatch center.
5. A means of two-way communication between a central location and each secure area, and consideration for maintaining means of communication in absence of primary power.
6. Identification of protective security measures.
7. Location of emergency supplies.
8. Accountability procedures for staff to report the presence or absence of occupants.
9. Identification of crisis response team members in accordance with the National Incident Management System emergency while in lockdown.
10. Actions to be taken in the event of a fire or medical emergency while in lockdown.

404.4 Maintenance. Emergency plans shall be reviewed or updated annually or as necessitated by changes in staff assignments, occupancy or the physical arrangement of the building.

404.5 Availability. Emergency plans shall be available in the workplace for reference and review by employees, and copies shall be furnished to the fire code official for review upon request.

404.5.1 Distribution. The fire safety and evacuation plans shall be distributed to the tenants and building service employees by the owner or owner's agent. Tenants shall distribute to their employees applicable parts of the fire safety plan affecting the employees' actions in the event of a fire or other emergency.

SECTION 405 EMERGENCY DRILLS

405.1 General. Emergency drills complying with the provisions of this section shall be conducted at least annually in the occupancies listed in Section 404.2.1 or when required by the fire code official. Drills shall be designed in cooperation with the local authorities.

405.2 Frequency. Required emergency drills shall be held at the intervals specified in Table 405.2 or more frequently where necessary to familiarize all occupants with the drill procedure.

405.2.1 Group E occupancies. The occupancy shall conduct at a minimum the following drills during the year.

1. One drill using the school mapping information system.

EXCEPTION: Day cares not colocated on a school campus.

2. Six fire evacuation drills.
3. One shelter-in-place drill.
4. One lockdown drill.

TABLE 405.2
EMERGENCY DRILL FREQUENCY AND PARTICIPATION

GROUP OR OCCUPANCY	FREQUENCY	PARTICIPATION
Group A	Quarterly	Employees
Group B[c]	Annually	Employees
Group E	Monthly[a,e]	All Occupants
Group F	Annually	Employees
Group I	Quarterly on each shift	Employees[b]
Group R-1	Quarterly on each shift	Employees
Group R-2[f]	Quarterly on each shift	Employees
Group R-2[d]	Four Annually	All Occupants
High-rise buildings	Annually	Employees

a. The frequency shall be allowed to be modified in accordance with Section 408.3.2.
b. Fire and evacuation drills in residential care assisted living facilities shall include complete evacuation of the premises in accordance with Section 408.10.5. Where occupants receive habilitation or rehabilitation training, fire prevention and fire safety practices shall be included as part of the training program.
c. Group B buildings having an occupant load of 500 or more persons or more than 100 persons above or below the lowest level of exit discharge.
d. Applicable to Group R-2 college and university buildings in accordance with Section 408.3.
e. Day cares colocated on a Group E campus shall participate in emergency drills occurring on the campus.
f. Applicable to boarding homes, group homes, and residential treatment facilities licensed by the state of Washington.

405.3 Leadership. Responsibility for the planning and conduct of drills shall be assigned to competent persons designated to exercise leadership.

405.4 Time. Drills shall be held at unexpected times and under varying conditions to simulate the unusual conditions that occur in case of an emergency.

405.5 Recordkeeping. Records shall be maintained of required emergency evacuation drills and include the following information:

1. Identity of the person conducting the drill.
2. Date and time of the drill.
3. Notification method used.
4. Staff members on duty and participating.
5. Number of occupants participating.
6. Special conditions simulated.
7. Problems encountered and corrective actions taken.
8. Weather conditions when occupants were evacuated.
9. Time required to accomplish complete evacuation, lockdown, or shelter-in-place.

405.6 Notification. Where required by the fire code official, prior notification of emergency drills shall be given to the fire code official.

405.7 Initiation. Emergency drills shall be initiated in accordance with Sections 405.7.1 through 405.7.3.

405.7.1 Fire evacuation drills. Where a fire alarm system is provided, emergency evacuation drills shall be initiated by activating the fire alarm system. The fire alarm monitoring company shall be notified prior to the activation of the fire alarm system for drill proposed and again at the conclusion of the transmission and restoration of the fire alarm system to normal mode.

EXCEPTION: Drills conducted between the hours of 9:00 p.m. and 6:00 a.m., in Group R-2 boarding homes, group homes, and residential treatment facilities licensed by the state of Washington.

405.7.2 Shelter-in-place drills. Shelter-in-place drills shall be initiated by the shelter-in-place alert signal, generated by the alerting system in accordance with Section 915.

405.7.3 Lockdown drills. Lockdown drills shall be initiated by the lockdown alert signal.

405.8 Accountability. As building occupants arrive at the assembly point, efforts shall be made to determine if all occupants have been successfully evacuated and/or have been accounted for in the lockdown or shelter-in-place.

405.9 Recall and reentry. The recall signal initiation means shall be manually operated and under the control of the person in charge of the premises or the official in charge of the incident. No one shall reenter the premises until authorized to do so by the official in charge.

SECTION 406 EMPLOYEE TRAINING AND RESPONSE PROCEDURES

406.1 General. Employees in the occupancies listed in Section 404.2.1 shall be trained in the emergency procedures described in their emergency plans. Training shall be based on these plans and as described in Section 404.2 and 404.3.

406.2 Frequency. Employees shall receive training in the contents of the emergency plans and their duties as part of new employee orientation and at least annually thereafter. Records shall be kept and made available to the fire code official upon request.

406.3 Employee training program. Employees shall be trained in fire prevention, evacuation, sheltering-in-place, lockdown and fire safety in accordance with Sections 406.3.1 through 406.3.4.

406.3.1 Fire prevention training. Employees shall be apprised of the fire hazards of the materials and processes to which they are exposed. Each employee shall be instructed in the proper procedures for preventing fires in the conduct of their assigned duties.

406.3.2 Evacuation training. Employees shall be familiarized with the fire alarm and evacuation signals, their assigned duties in the event of an alarm or emergency, evacuation routes, areas of refuge, exterior assembly areas and procedures for evacuation.

406.3.3 Emergency shelter-in-place and lockdown training. Where a facility has a shelter-in-place or lockdown plan, employees shall be trained on the alert and recall signals, communication system, location of emergency supplies, the use of the incident notification and alarm system, and their

assigned duties and procedures in the event of an alarm or emergency.

406.3.4 Fire safety training. Employees assigned firefighting duties shall be trained to know the locations and proper use of portable fire extinguishers or other manual firefighting equipment and the protective clothing or equipment required for its safe and proper use.

SECTION 407 HAZARD COMMUNICATION

407.1 General. The provisions of Sections 407.2 through 407.7 shall be applicable where hazardous materials subject to permits under Section 2701.5 are located on the premises or where required by the fire code official.

407.2 Material safety data sheets. Material safety data sheets (MSDS) for all hazardous materials shall be either readily available on the premises as a paper copy, or where approved, shall be permitted to be readily retrievable by electronic access.

407.3 Identification. Individual containers of hazardous materials, cartons or packages shall be marked or labeled in accordance with applicable federal regulations. Buildings, rooms and spaces containing hazardous materials shall be identified by hazard warning signs in accordance with Section 2703.5.

407.4 Training. Persons responsible for the operation of areas in which hazardous materials are stored, dispensed, handled or used shall be familiar with the chemical nature of the materials and the appropriate mitigating actions necessary in the event of a fire, leak or spill. Responsible persons shall be designated and trained to be liaison personnel for the fire department. These persons shall aid the fire department in preplanning emergency responses and identification of the locations where hazardous materials are located, and shall have access to material safety data sheets and be knowledgeable in the site emergency response procedures.

407.5 Hazardous materials inventory statement. Where required by the fire code official, each application for a permit shall include a hazardous materials inventory statement (HMIS) in accordance with Section 2701.5.2.

407.6 Hazardous materials management plan. Where required by the fire code official, each application for a permit shall include a hazardous materials management plan (HMMP) in accordance with Section 2701.5.1. The fire code official is authorized to accept a similar plan required by other regulations.

407.7 Facility closure plans. The permit holder or applicant shall submit to the fire code official a facility closure plan in accordance with Section 2701.6.3 to terminate storage, dispensing, handling or use of hazardous materials.

SECTION 408 USE AND OCCUPANCY-RELATED REQUIREMENTS

408.1 General. In addition to the other requirements of this chapter, the provisions of this section are applicable to specific occupancies listed herein.

408.2 Group A occupancies. Group A occupancies shall comply with the requirements of Sections 408.2.1 and 408.2.2 and Sections 401 through 406.

408.2.1 Seating plan. The fire safety and evacuation plans for assembly occupancies shall include the information required by Section 404.3 and a detailed seating plan, occupant load and occupant load limit. Deviations from the approved plans shall be allowed provided the occupant load limit for the occupancy is not exceeded and the aisles and exit accessways remain unobstructed.

408.2.2 Announcements. In theaters, motion picture theaters, auditoriums and similar assembly occupancies in Group A used for noncontinuous programs, an audible announcement shall be made not more than 10 minutes prior to the start of each program to notify the occupants of the location of the exits to be used in the event of a fire or other emergency.

EXCEPTION: In motion picture theaters, the announcement is allowed to be projected upon the screen in a manner approved by the fire code official.

408.3 Group E occupancies and Group R-2 college and university buildings. Group E occupancies shall comply with the requirements of Sections 408.3.1 through 408.3.4 and Sections 401 through 406. Group R-2 college and university buildings shall comply with the requirements of Sections 408.3.1 and 408.3.3 and Sections 401 through 406.

408.3.1 First emergency evacuation drill. The first emergency evacuation drill of each school year shall be conducted within 10 days of the beginning of classes.

408.3.2 Emergency evacuation drill deferral. In severe climates, the fire code official shall have the authority to modify the emergency evacuation drill frequency specified in Section 405.2.

408.3.3 Time of day. Emergency evacuation drills shall be conducted at different hours of the day or evening, during the changing of classes, when the school is at assembly, during the recess or gymnastic periods, or during other times to avoid distinction between drills and actual fires. In Group R-2 college and university buildings, one required drill shall be held during hours after sunset or before sunrise.

408.3.4 Assembly points. Outdoor assembly areas shall be designated and shall be located a safe distance from the building being evacuated so as to avoid interference with fire department operations. The assembly areas shall be arranged to keep each class separate to provide accountability of all individuals.

408.4 Group H-5 occupancies. Group H-5 occupancies shall comply with the requirements of Sections 408.4.1 through 408.4.4 and Sections 401 through 407.

408.4.1 Plans and diagrams. In addition to the requirements of Sections 404 and 407.6, plans and diagrams shall be maintained in approved locations indicating the approximate plan for each area, the amount and type of HPM stored, handled and used, locations of shutoff valves for HPM supply piping, emergency telephone locations and locations of exits.

408.4.2 Plan updating. The plans and diagrams required by Section 408.4.1 shall be maintained up to date and the fire code official and fire department shall be informed of all major changes.

408.4.3 Emergency response team. Responsible persons shall be designated the on-site emergency response team and trained to be liaison personnel for the fire department. These persons shall aid the fire department in preplanning emergency responses, identifying locations where HPM is stored, handled and used, and be familiar with the chemical nature of such material. An adequate number of personnel for each work shift shall be designated.

408.4.4 Emergency drills. Emergency drills of the on-site emergency response team shall be conducted on a regular basis but not less than once every three months. Records of drills conducted shall be maintained.

408.5 Group I-1 occupancies. Group I-1 occupancies shall comply with the requirements of Sections 408.5.1 through 408.5.5 and Sections 401 through 406.

408.5.1 Fire safety and evacuation plan. The fire safety and evacuation plan required by Section 404 shall include special staff actions including fire protection procedures necessary for residents and shall be amended or revised upon admission of any resident with unusual needs.

408.5.2 Staff training. Employees shall be periodically instructed and kept informed of their duties and responsibilities under the plan. Such instruction shall be reviewed by the staff at least every two months. A copy of the plan shall be readily available at all times within the facility.

408.5.3 Resident training. Residents capable of assisting in their own evacuation shall be trained in the proper actions to take in the event of a fire. The training shall include actions to take if the primary escape route is blocked. Where the resident is given rehabilitation or habilitation training, training in fire prevention and actions to take in the event of a fire shall be a part of the rehabilitation training program. Residents shall be trained to assist each other in case of fire to the extent their physical and mental abilities permit them to do so without additional personal risk.

408.5.4 Drill frequency. Emergency evacuation drills shall be conducted at least six times per year, two times per year on each shift. Twelve drills shall be conducted in the first year of operation. Drills are not required to comply with the time requirements of Section 405.4.

408.5.5 Resident participation. Emergency evacuation drills shall involve the actual evacuation of residents to a selected assembly point.

408.6 Group I-2 occupancies. Group I-2 occupancies shall comply with the requirements of Sections 408.6.1 and 408.6.2 and Sections 401 through 406. Drills are not required to comply with the time requirements of Section 405.4.

408.6.1 Evacuation not required. During emergency evacuation drills, the movement of patients to safe areas or to the exterior of the building is not required.

408.6.2 Coded alarm signal. When emergency evacuation drills are conducted after visiting hours or when patients or residents are expected to be asleep, a coded announcement is allowed instead of audible alarms.

408.7 Group I-3 occupancies. Group I-3 occupancies shall comply with the requirements of Sections 408.7.1 through 408.7.4 and Sections 401 through 406.

408.7.1 Employee training. Employees shall be instructed in the proper use of portable fire extinguishers and other manual fire suppression equipment. Training of new staff shall be provided promptly upon entrance on duty. Refresher training shall be provided at least annually.

408.7.2 Staffing. Group I-3 occupancies shall be provided with 24-hour staffing. Staff shall be within three floors or 300 feet (91,440 mm) horizontal distance of the access door of each resident housing area. In Use Conditions 3, 4 and 5, as defined in Chapter 2, the arrangement shall be such that the staff involved can start release of locks necessary for emergency evacuation or rescue and initiate other necessary emergency actions within 2 minutes of an alarm.

EXCEPTION: Staff shall not be required to be within three floors or 300 feet (9144 mm) in areas in which all locks are unlocked remotely and automatically in accordance with Section 408.4 of the *International Building Code*.

408.7.3 Notification. Provisions shall be made for residents in Use Conditions 3, 4 and 5, as defined in Chapter 2, to readily notify staff of an emergency.

408.7.4 Keys. Keys necessary for unlocking doors installed in a means of egress shall be individually identifiable by both touch and sight.

408.8 Group R-1 occupancies. Group R-1 occupancies shall comply with the requirements of Sections 408.8.1 through 408.8.3 and Sections 401 through 406.

408.8.1 Evacuation diagrams. A diagram depicting two evacuation routes shall be posted on or immediately adjacent to every required egress door from each hotel, motel or dormitory sleeping unit.

408.8.2 Emergency duties. Upon discovery of a fire or suspected fire, hotel, motel and dormitory employees shall perform the following duties:

1. Activate the fire alarm system, where provided.
2. Notify the public fire department.
3. Take other action as previously instructed.

408.8.3 Fire safety and evacuation instructions. Information shall be provided in the fire safety and evacuation plan required by Section 404 to allow guests to decide whether to evacuate to the outside, evacuate to an area of refuge, remain in place, or any combination of the three.

408.9 Group R-2 occupancies. Group R-2 occupancies shall comply with the requirements of Sections 408.9.1 through 408.9.3 and Sections 401 through 406.

408.9.1 Emergency guide. A fire emergency guide shall be provided which describes the location, function and use of fire protection equipment and appliances accessible to residents, including fire alarm systems, smoke alarms, and porta-

ble fire extinguishers. The guide shall also include an emergency evacuation plan for each dwelling unit.

408.9.2 Maintenance. Emergency guides shall be reviewed and approved in accordance with Section 401.2.

408.9.3 Distribution. A copy of the emergency guide shall be given to each tenant prior to initial occupancy.

408.10 Group R-4 occupancies. This section is not adopted.

408.11 Covered mall buildings. Covered mall buildings shall comply with the provisions of Sections 408.11.1 through 408.11.3.

408.11.1 Lease plan. A lease plan shall be prepared for each covered mall building. The plan shall include the following information in addition to that required by Section 404.3.2:

1. Each occupancy, including identification of tenant.
2. Exits from each tenant space.
3. Fire protection features, including the following:
3.1. Fire department connections.
3.2. Fire command center.
3.3. Smoke management system controls.
3.4. Elevators, elevator machine rooms and controls.
3.5. Hose valve outlets.
3.6. Sprinkler and standpipe control valves.
3.7. Automatic fire-extinguishing system areas.
3.8. Automatic fire detector zones.
3.9. Fire barriers.

408.11.1.1 Submittal. The lease plan shall be submitted to the fire code official, and shall be maintained on-site for immediate reference by responding fire service personnel.

408.11.1.2 Revisions. The lease plans shall be reviewed and revised annually or as often as necessary to keep them current. Modifications or changes in tenants or occupancies shall not be made without prior approval of the fire code official and building official.

408.11.2 Tenant identification. Each occupied tenant space provided with a secondary exit to the exterior or exit corridor shall be provided with tenant identification by business name and/or address. Letters and numbers shall be posted on the corridor side of the door, be plainly legible and shall contrast with their background.

EXCEPTION: Tenant identification is not required for anchor stores.

408.11.3 Maintenance. Unoccupied tenant spaces shall be:

1. Kept free from the storage of any materials.

2. Separated from the remainder of the building by partitions of at least 0.5-inch-thick (12.7 mm) gypsum board or an approved equivalent to the underside of the ceiling of the adjoining tenant spaces.

3. Without doors or other access openings other than one door that shall be kept key locked in the closed position except during that time when opened for inspection.

4. Kept free from combustible waste and be broom swept clean.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 10-03-100, § 51-54-0400, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.190, 19.27.020, and chapters 19.27 and 34.05 RCW. 09-04-027, § 51-54-0400, filed 1/28/09, effective 7/1/09. Statutory Authority: RCW 19.27.031, 19.27.074, and chapters 19.27 and 34.05 RCW. 07-01-093, § 51-54-0400, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.020, 19.27.031, 19.27.074 and chapters 19.27 and 34.05 RCW. 05-01-016, § 51-54-0400, filed 12/2/04, effective 7/1/05.]

WAC 51-54-0500 Chapter 5—Fire service features.

SECTION 503 FIRE APPARATUS ACCESS ROADS.

503.1 Where required. Fire apparatus access roads shall be provided and maintained in accordance with locally adopted street, road, and access standards.

503.1.1 Buildings and facilities, is not adopted.

503.1.2 Additional access, is not adopted.

503.1.3 High-piled storage, is not adopted.

503.2 Specifications. This section is not adopted.

503.3 Marking. This section is not adopted.

503.4 Obstruction of fire apparatus access roads. This section is not adopted.

SECTION 507 FIRE PROTECTION WATER SUPPLIES

507.3 Fire flow. Fire flow requirements for buildings or portions of buildings and facilities shall be determined by an approved method.

EXCEPTION: Fire flow is not required for structures under 500 square feet with a B, U or R-1 occupancy where structures are at least 30 feet from any other structure and are used only for recreation.

SECTION 508 FIRE COMMAND CENTER

508.1.2 Separation. The fire command center shall be separated from the remainder of the building by not less than a 2-hour fire barrier constructed in accordance with Section 707 of the International Building Code or horizontal assembly constructed in accordance with Section 712 of the International Building Code, or both.

[Statutory Authority: Chapter 19.27 RCW. 10-24-059, § 51-54-0500, filed 11/29/10, effective 7/1/11. Statutory Authority: RCW 19.27.031 and 19.27.074. 10-03-100, § 51-54-0500, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.031, 19.27.074, and chapters 19.27 and 34.05 RCW. 07-01-093, § 51-54-0500, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-105, § 51-54-0500, filed 12/17/03, effective 7/1/04.]

WAC 51-54-0600 Chapter 6—Building services and systems.

SECTION 609 COMMERCIAL KITCHEN HOODS

[M] 609.2 Where required. A Type I hood shall be installed at or above all commercial cooking appliances and domestic cooking appliances used for commercial purposes that produce grease laden vapors.

EXCEPTION: A Type I hood shall not be required to be installed in R-2 occupancies licensed by the state of Washington.

609.3 Operations, inspection and maintenance. Commercial cooking systems shall be operated, inspected and maintained in accordance with Sections 609.3.1 through 609.3.4 and Chapter 11 of NFPA 96.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 10-03-100, § 51-54-0600, filed 1/20/10, effective 7/1/10.]

Reviser's note: The brackets and enclosed material in the text of the above section occurred in the copy filed by the agency.

WAC 51-54-0800 Chapter 8—Interior finish, decorative materials and furnishings.

806.1.1 Restricted occupancies. Natural cut trees shall be prohibited in the following occupancies:

1. Group I; and

2. R-2 Occupancies providing licensed care to clients in one of the categories listed in IBC Section 310.1 licensed by Washington state.

806.1.2 Support devices. The support device that holds the tree in an upright position shall be of a type that is stable and that meets all of the following criteria:

1. The device shall hold the tree securely and be of adequate size to avoid tipping over of the tree.

2. The device shall be capable of containing a minimum supply of water in accordance with Table 806.1.2.

3. The water level, when full, shall cover the tree stem at least 2 inches (51 mm). The water level shall be maintained above the fresh cut and checked at least once daily.

Table 806.1.2—Support Stand Water Capacity

Tree Stem Diameter (inches)	Minimum Support Stand Water Capacity (gallons)	Typical Daily Water Transpiration Amount (gallons)
Up to 4	1	1/4 to 1
4 to 6	1 1/2	1 1/4 to 1 1/2
7 to 8	2	1 3/4 to 2
9 to 12	3	2 1/4 to 3
13 and over	4	Over 3

[Statutory Authority: RCW 19.27.031 and 19.27.074. 10-03-100, § 51-54-0800, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.031, 19.27.074, and chapters 19.27 and 34.05 RCW. 07-01-093, § 51-54-0800, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.020, 19.27.031, 19.27.074 and chapters 19.27 and 34.05 RCW. 05-01-016, § 51-54-0800, filed 12/2/04, effective 7/1/05.]

WAC 51-54-0900 Chapter 9—Fire protection systems.

902.1 Definitions.

ALERT SIGNAL. See Section 402.1.

ALERTING SYSTEM. See Section 402.1.

PORTABLE SCHOOL CLASSROOM. A structure, transportable in one or more sections, which requires a chassis to be transported, and is designed to be used as an educational space with or without a permanent foundation. The structure shall be trailerable and capable of being demounted and relocated to other locations as needs arise.

903.2.1.6 Nightclub. An automatic sprinkler system shall be provided throughout Group A-2 nightclubs as defined in this code.

903.2.3 Group E. An automatic sprinkler system shall be provided for Group E Occupancies.

EXCEPTIONS:
1. Portable school classrooms, provided aggregate area of any cluster or portion of a cluster of portable school classrooms does not exceed 5,000 square feet (1465 m^2); and clusters of portable school classrooms shall be separated as required by the building code.
2. Group E Occupancies with an occupant load of 50 or less, calculated in accordance with Table 1004.1.1.

903.2.7 Group M. An automatic sprinkler system shall be provided throughout buildings containing a Group M occupancy, where one of the following conditions exists:

1. A Group M fire area exceeds 12,000 square feet (1115 m^2).

2. A Group M fire area is located more than three stories above grade plane.

3. The combined area of all Group M fire areas on all floors, including any mezzanines, exceeds 24,000 square feet (2230 m^2).

4. Where a Group M occupancy that is used for the display and sale of upholstered furniture or mattresses exceeds 5000 square feet (464 m^2).

903.2.8 Group R. An automatic sprinkler system installed in accordance with Section 903.3 shall be provided throughout all buildings with a Group R fire area.

EXCEPTION: Group R-1 if all of the following conditions apply:
1. The Group R fire area is no more than 500 square feet and is used for recreational use only.
2. The Group R fire area is on only one story.
3. The Group R fire area does not include a basement.
4. The Group R fire area is no closer than 30 feet from another structure.
5. Cooking is not allowed within the Group R fire area.
6. The Group R fire area has an occupant load of no more than 8.
7. A hand held (portable) fire extinguisher is in every Group R fire area.

SECTION 906—PORTABLE FIRE EXTINGUISHERS

906.1 Where required. Portable fire extinguishers shall be installed in the following locations:

1. In new and existing Group A, B, E, F, H, I, M, R-1, R-2, R-4 and S occupancies.

2. Within 30 feet (9144 mm) of commercial cooking equipment.

3. In areas where flammable or combustible liquids are stored, used or dispensed.

4. On each floor of structures under construction, except Group R-3 occupancies, in accordance with Section 1415.1.

5. Where required by the sections indicated in Table 906.l.

6. Special-hazard areas, including, but not limited to, laboratories, computer rooms and generator rooms, where required by the fire code official.

SECTION 907—FIRE ALARM AND DETECTION SYSTEMS

[F] 907.2.8 Group R-1. Fire alarm systems, smoke alarms and carbon monoxide alarms shall be installed in Group R-1 occupancies as required in this section and Section 907.2.8.4.

[F] 907.2.8.4. Carbon monoxide alarms. For new construction, an approved carbon monoxide alarm shall be installed by January 1, 2011, outside of each separate sleeping area in the immediate vicinity of the bedroom in sleeping units. In a building where a tenancy exists, the tenant shall maintain the CO alarm as specified by the manufacturer including replacement of the batteries.

[F] 907.2.8.4.1 Existing sleeping units. Existing sleeping units shall be equipped with carbon monoxide alarms by July 1, 2011.

[F] 907.2.8.4.2 Alarm requirements. Single station carbon monoxide alarms shall be listed as complying with UL 2034 and shall be installed in accordance with this code and the manufacturer's installation instructions.

[F] 907.2.9 Group R-2. Fire alarm systems, smoke alarms and carbon monoxide alarms shall be installed in Group R-2 occupancies as required in Sections 907.2.9.1 through 907.2.9.3.

[F] 907.2.9.1.1 Group R-2 boarding homes. A manual fire alarm system shall be installed in Group R-2 occupancies where the building contains a boarding home licensed by the state of Washington.

EXCEPTION: In boarding homes licensed by the state of Washington, manual fire alarm boxes in resident sleeping areas shall not be required at exits if located at all constantly attended staff locations, provided such staff locations are visible, continuously accessible, located on each floor, and positioned so no portion of the story exceeds a horizontal travel distance of 200 feet to a manual fire alarm box.

[F] 907.2.9.3 Carbon monoxide alarms. For new construction, an approved carbon monoxide alarm shall be installed by January 1, 2011, outside of each separate sleeping area in the immediate vicinity of the bedroom in dwelling units. In a building where a tenancy exists, the tenant shall maintain the CO alarm as specified by the manufacturer including replacement of the batteries.

[F] 907.2.9.3.1 Existing dwelling units. Existing dwelling units shall be equipped with carbon monoxide alarms by July 1, 2011.

[F] 907.2.10 Group R-3. Carbon monoxide alarms shall be installed in Group R-3 occupancies as required in Sections 907.2.10.1 through 907.2.10.3.

[F] 907.2.l0.1 Carbon monoxide alarms. For new construction, an approved carbon monoxide alarm shall be installed by January 1, 2011, outside of each separate sleeping area in the immediate vicinity of the bedroom in dwelling units. In a building where a tenancy exists, the tenant shall maintain the CO alarm as specified by the manufacturer including replacement of the batteries.

[F] 907.2.10.2 Existing dwelling units. Existing dwelling units shall be equipped with carbon monoxide alarms by July 1, 2011.

EXCEPTION: Owner-occupied Group R-3 residences legally occupied prior to July 1, 2010.

[F] 907.2.10.3 Alarm requirements. Single station carbon monoxide alarms shall be listed as complying with UL 2034 and shall be installed in accordance with this code and the manufacturer's installation instructions.

909.6.3 Elevator shaft pressurization. Where elevator shaft pressurization is required to comply with Exception 6 of IBC Section 708.14.1, the pressurization system shall comply with and be maintained in accordance with IBC 708.14.2.

909.6.3.1 Activation. The elevator shaft pressurization system shall be activated by a fire alarm system which shall include smoke detectors or other approved detectors located near the elevator shaft on each floor as approved by the building official and fire code official. If the building has a fire alarm panel, detectors shall be connected to, with power supplied by, the fire alarm panel.

909.6.3.2 Power system. The power source for the fire alarm system and the elevator shaft pressurization system shall be in accordance with Section 909.11.

SECTION 915 ALERTING SYSTEMS

915.1 General. An approved alerting system shall be provided in buildings and structures as required in chapter 4 and this section, unless other requirements are provided by another section of this code.

EXCEPTION: Approved alerting systems in existing buildings, structures or occupancies.

915.2 Power source. Alerting systems shall be provided with power supplies in accordance with Section 4.4.1 of NFPA 72 and circuit disconnecting means identified as "EMERGENCY ALERTING SYSTEM."

EXCEPTION: Systems which do not require electrical power to operate.

915.3 Duration of Operation. The alerting system shall be capable of operating under nonalarm condition (quiescent load) for a minimum of 24 hours and then shall be capable of operating during an emergency condition for a period of 15 minutes at maximum connected load.

915.4 Combination system. Alerting system components and equipment shall be allowed to be used for other purposes.

915.4.1 System priority. The alerting system use shall take precedence over any other use.

915.4.2 Fire alarm system. Fire alarm systems sharing components and equipment with alerting systems must be in accordance with Section 6.8.4 of NFPA 72.

915.4.2.1 Signal priority. Recorded or live alert signals generated by an alerting system that shares components with a fire alarm system shall, when actuated, take priority over fire alarm messages and signals.

915.4.2.2 Temporary deactivation. Should the fire alarm system be in the alarm mode when such an alerting system is actuated, it shall temporarily cause deactivation of all fire alarm-initiated audible messages or signals during the time period required to transmit the alert signal.

915.4.2.3 Supervisory signal. Deactivation of fire alarm audible and visual notification signals shall cause a supervisory signal for each notification zone affected in the fire alarm system.

915.5 Audibility. Audible characteristics of the alert signal shall be in accordance with Section 7.4.1 of NFPA 72 throughout the area served by the alerting system.

EXCEPTION: Areas served by approved visual or textual notification, where the visible notification appliances are not also used as a fire alarm signal, are not required to be provided with audibility complying with Section 915.6.

915.6 Visibility. Visible and textual notification appliances shall be permitted in addition to alert signal audibility.

[Statutory Authority: Chapter 19.27 RCW. 10-24-059, § 51-54-0900, filed 11/29/10, effective 7/1/11. Statutory Authority: RCW 19.27.031 and 19.27.074. 10-03-100, § 51-54-0900, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.190, 19.27.020, and chapters 19.27 and 34.05 RCW. 09-04-027, § 51-54-0900, filed 1/28/09, effective 7/1/10; 08-01-101, § 51-54-0900, filed 12/18/07, effective 4/1/08. Statutory Authority: RCW 19.27.031, 19.27.074, and chapters 19.27 and 34.05 RCW. 07-01-093, § 51-54-0900, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.020, 19.27.031, 19.27.074 and chapters 19.27 and 34.05 RCW. 05-24-071, § 51-54-0900, filed 12/5/05, effective 7/1/06. Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-105, § 51-54-0900, filed 12/17/03, effective 7/1/04.]

Reviser's note: The brackets and enclosed material in the text of the above section occurred in the copy filed by the agency.

WAC 51-54-1000 Chapter 10—Means of egress.

SECTION 1005 EGRESS WIDTH

1005.1 Minimum required egress width. The means of egress width shall not be less than required by this section. The total width of means of egress in inches (mm) shall not be less than the total occupant load served by the means of egress multiplied by 0.3 inches (7.62 mm) per occupant for stairways and by 0.2 inches (5.08 mm) per occupant for other egress components. The width shall not be less than specified elsewhere in this code. Multiple means of egress shall be sized such that the loss of any one means of egress shall not reduce the available capacity to less than 50 percent of the required capacity. The maximum capacity required from any story of a building shall be maintained to the termination of the means of egress.

EXCEPTIONS:
1. Means of egress complying with Section 1028.
2. For other than H and I-2 occupancies, the total width of means of egress in inches (mm) shall not be less than the total occupant load served by the means of egress multiplied by 0.2 inches (5.1 mm) per occupant for stairways and by 0.15 inches (3.8 mm) per occupant for other egress components in buildings that are provided with sprinkler protection in accordance with 903.3.1.1 or 903.3.1.2 and an emergency voice/alarm communication system in accordance with 907.5.2.2.

SECTION 1007 ACCESSIBLE MEANS OF EGRESS

1007.1 Accessible means of egress required. Accessible means of egress shall comply with this section. Accessible spaces shall be provided with not less than one accessible means of egress. Where more than one means of egress are required by Section 1015.1 or 1021.1 from any accessible space, each accessible portion of the space shall be served by not less than two accessible means of egress.

EXCEPTIONS:
1. Accessible means of egress are not required in alterations to existing buildings.
2. One accessible means of egress is required from an accessible mezzanine level in accordance with Section 1007.3, 1007.4 or 1007.5.
3. In assembly areas with sloped or stepped aisles, one accessible means of egress is permitted where the common path of travel is accessible and meets the requirements in Section 1028.8.
4. In parking garages, accessible means of egress are not required to serve parking areas that do not contain accessible parking spaces.

1007.8 Two-way communication. A two-way communication system shall be provided at the elevator landing on each accessible floor that is one or more stories above or below the story of exit discharge complying with Sections 1007.8.1 and 1007.8.2.

EXCEPTIONS:
1. Two-way communication systems are not required at the elevator landing where two-way communication is provided within the areas of refuge in accordance with Section 1007.6.3.
2. Two-way communication systems are not required on floors provided with exit ramps conforming to provisions of Section 1010.

1007.8.1 System requirements. Two-way communication systems shall provide communication between each required location and the fire command center or a central control point location approved by the fire department. Where the central control point is not constantly attended, a two-way communication system shall have a timed automatic telephone dial-out capability to a monitoring location. The two-way communication system shall include both audible and visible signals. The two-way communication system shall have a battery backup or an approved alternate source of power that is capable of 90 minutes use upon failure of the normal power source.

SECTION 1008 DOORS, GATES AND TURNSTILES

1008.1.9.3 Locks and latches. Locks and latches shall be permitted to prevent operation of doors where any of the following exists:

1. Places of detention or restraint.

2. In buildings in occupancy Group A having an occupant load of 300 or less, Groups B, F, M and S, and in places of religious worship, the main exterior door or doors are permitted to be equipped with key-operated locking devices from the egress side provided:

2.1 The locking device is readily distinguishable as locked;

2.2 A readily visible sign is posted on the egress side on or adjacent to the door stating: THIS DOOR TO REMAIN UNLOCKED WHEN BUILDING IS OCCUPIED. The sign shall be in letters 1 inch (25 mm) high on a contrasting background; and

2.3 The use of the key-operated locking device is revocable by the building official for due cause.

3. Where egress doors are used in pairs, approved automatic flush bolts shall be permitted to be used, provided that the door leaf having the automatic flush bolts has no doorknob or surface-mounted hardware.

4. Doors from individual dwelling or sleeping units of Group R occupancies having an occupant load of 10 or less are permitted to be equipped with a night latch, dead bolt, or security chain, provided such devices are openable from the inside without the use of a key or a tool.

5. Fire doors after the minimum elevated temperature has disabled the unlatching mechanism in accordance with listed fire door test procedures.

6. Approved, listed locks without delayed egress shall be permitted in Group R-2 boarding homes licensed by Washington state, provided that:

6.1. The clinical needs of one or more patients require specialized security measures for their safety.

6.2. The doors unlock upon actuation of the automatic sprinkler system or automatic fire detection system.

6.3. The doors unlock upon loss of electrical power controlling the lock or lock mechanism.

6.4. The lock shall be capable of being deactivated by a signal from a switch located in an approved location.

6.5. There is a system, such as a keypad and code, in place that allows visitors, staff persons and appropriate residents to exit. Instructions for exiting shall be posted within six feet of the door.

1008.1.9.6 Special locking arrangements in Group I-2. Approved locks shall be permitted in a Group I-2 Occupancy where the clinical needs of persons receiving care require such locking. Locks shall be permitted in such occupancies where the building is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or an approved automatic smoke or heat detection system installed in accordance with Section 907, provided that the doors unlock in accordance with Items 1 through 6 below.

1. The doors unlock upon actuation of the automatic sprinkler system or automatic fire detection system.

2. The doors unlock upon loss of power controlling the lock or lock mechanism.

3. The door locks shall have the capability of being unlocked by a signal from the fire command center, a nursing station or other approved location.

4. The procedures for the operation(s) of the unlocking system shall be described and approved as part of the emergency planning and preparedness required by Chapter 4 of the International Fire Code.

5. There is a system, such as a keypad and code, in place that allows visitors, staff persons and appropriate residents to exit. Instructions for exiting shall be posted within six feet of the door.

6. Emergency lighting shall be provided at the door.

EXCEPTION: Items 1, 2, 3, and 5 shall not apply to doors to areas where persons which because of clinical needs require restraint or containment as part of the function of a Group I-2 mental hospital provided that all clinical staff shall have the keys, codes or other means necessary to operate the locking devices.

SECTION 1009 STAIRWAYS

1009.15 Stairways in individual dwelling units. Stairs or ladders within an individual dwelling unit used for access to areas of 200 square feet (18.6 m^2) or less, and not containing the primary bathroom or kitchen, are exempt from the requirements of Section 1009.

SECTION 1010 RAMPS

1010.1 Scope. The provisions of this section shall apply to ramps used as a component of a means of egress.

EXCEPTIONS:
1. Other than ramps that are part of the accessible routes providing access in accordance with Sections 1108.2 through 1108.2.4 and 1108.2.6, ramped aisles within assembly rooms or spaces shall conform with the provisions in Section 1028.11.
2. Curb ramps shall comply with ICC A117.1.
3. Vehicle ramps in parking garages for pedestrian exit access shall not be required to comply with Sections 1010.3 through 1010.9 when they are not an accessible route serving accessible parking spaces or other required accessible elements.
4. In a parking garage where one accessible means of egress serving accessible parking spaces or other accessible elements is provided, a second accessible means of egress serving that area may include a vehicle ramp that does not comply with Sections 1010.4 through 1010.8.

SECTION 1014 EXIT ACCESS

1014.2.2 Group I-2. General. Habitable spaces and suites in Group I-2 Occupancies are permitted to comply with this Section 1014.2.2.

1014.2.2.1 Exit access doors. Habitable spaces and suites in Group I-2 Occupancies shall have an exit access door leading directly to a corridor.

EXCEPTION: Rooms with exit doors opening directly to the outside at ground level.

1014.2.2.2 Exit access through suites. Exit access from areas not classified as a Group I-2 Occupancy suite shall not pass through a suite. In a suite required to have more than one exit, one exit access may pass through an adjacent suite if all other requirements of Section 1014.2 are satisfied.

1014.2.2.3 Separation. Suites in Group I-2 Occupancies shall be separated from other portions of the building by a smoke partition complying with Section 711. Partitions within suites are not required to be smoke-resistant or fire-resistance-rated unless required by another section of this Code.

1014.2.2.4 Suites containing patient sleeping areas. Patient sleeping areas in Group I-2 Occupancies shall be permitted to be divided into suites with one intervening room if one of the following conditions is met:

1. The intervening room within the suite is not used as an exit access for more than eight patient beds.

2. The arrangement of the suite allows for direct and constant visual supervision by nursing personnel.

1014.2.2.4.1 Area. Suites of sleeping rooms shall not exceed 5,000 square feet (465 m^2).

1014.2.2.4.2 Exit access. Any patient sleeping room, or any suite that includes patient sleeping rooms, of more than 1,000 square feet (93 m^2) shall have at least two exit access doors located in accordance with Section 1015.2.

1014.2.2.4.3 Travel distance. The travel distance between any point in a suite of sleeping rooms and an exit access door of that suite shall not exceed 100 feet (30,480 mm). The travel distance between any point in a Group I-2 Occupancy patient sleeping room and an exit access door in that room shall not exceed 50 feet (15,240 mm).

1014.2.2.5 Suites not containing patient sleeping areas. Areas other than patient sleeping areas in Group I-2 Occupancies shall be permitted to be divided into suites that comply with Sections 1014.2.2.5.1 through 1014.2.2.5.4.

1014.2.2.5.1 Area. Suites of rooms, other than patient sleeping rooms, shall not exceed 10,000 square feet (929 m^2).

1014.2.2.5.2 Exit access. Any room or suite of rooms, other than patient sleeping rooms, of more than 2,500 square feet (232 m^2) shall have at least two exit access doors located in accordance with Section 1015.2.

1014.2.2.5.3 One intervening room. For rooms other than patient sleeping rooms, suites of rooms are permitted to have one intervening room if the travel distance within the suite to the exit access door is not greater than 100 feet (30,480 mm).

1014.2.2.5.4 Two intervening rooms. For rooms other than patient sleeping rooms located within a suite, exit access travel from within the suite shall be permitted through two intervening rooms where the travel distance to the exit access door is not greater than 50 feet (15,240 mm).

SECTION 1018 CORRIDORS

1018.5 Air movement in corridors. Corridors shall not serve as supply, return, exhaust, relief or ventilation air ducts.

EXCEPTIONS:
1. Use of a corridor as a source of makeup air for exhaust systems in rooms that open directly onto such corridors, including toilet rooms, bathrooms, dressing rooms, smoking lounges and janitor closets, shall be permitted, provided that each such corridor is directly supplied with outdoor air at a rate greater than the rate of makeup air taken from the corridor.
2. Where located within a dwelling unit, the use of corridors for conveying return air shall not be prohibited.
3. Where located within tenant spaces of one thousand square feet (93 m^2) or less in area, utilization of corridors for conveying return air is permitted.
4. Incidental air movement from pressurized rooms within health care facilities, provided that a corridor is not the primary source of supply or return to the room.
5. Where such air is part of an engineered smoke control system.
6. Air supplied to corridors serving residential occupancies shall not be considered as providing ventilation air to the dwelling units subject to the following:
6.1 The air supplied to the corridor is one hundred percent outside air; and
6.2 The units served by the corridor have conforming ventilation air independent of the air supplied to the corridor; and
6.3 For other than high-rise buildings, the supply fan will automatically shut off upon activation of corridor smoke detectors which shall be spaced at no more than thirty feet (9,144 mm) on center along the corridor; or
6.4 For high-rise buildings, corridor smoke detector activation will close required smoke/fire dampers at the supply inlet to the corridor at the floor receiving the alarm.

1018.6 Corridor continuity. Fire-resistance-rated corridors shall be continuous from the point of entry to an exit, and shall not be interrupted by intervening rooms.

EXCEPTIONS:
1. Foyers, lobbies or reception rooms constructed as required for corridors shall not be construed as intervening rooms.
2. In Group R-2 boarding homes and residential treatment facilities licensed by Washington state, seating areas shall be allowed to be open to the corridor provided:
2.1 The seating area is constructed as required for the corridor;
2.2 The floor is separated into at least two compartments complying with Section 407.4;
2.3 Each individual seating area does not exceed 150 square feet, excluding the corridor width;
2.4 The combined total space of seating areas per compartment does not exceed 300 square feet, excluding the corridor width;
2.5 Combustible furnishings located within the seating area shall be in accordance with the International Fire Code Section 805; and
2.6 Emergency means of egress lighting is provided as required by Section 1006 to illuminate the area.

[Statutory Authority: Chapter 19.27 RCW. 10-24-059 and 11-01-001, § 51-54-1000, filed 11/29/10 and 12/1/10, effective 7/1/11. Statutory Authority: RCW 19.27.190, 19.27.020, and chapters 19.27 and 34.05 RCW. 09-04-027, § 51-54-1000, filed 1/28/09, effective 7/1/10. Statutory Authority: RCW 19.27.031, 19.27.074, and chapters 19.27 and 34.05 RCW. 07-01-093, § 51-54-1000, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-105, § 51-54-1000, filed 12/17/03, effective 7/1/04.]

WAC 51-54-1100 Aircraft-fueling vehicles.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 10-03-100, § 51-54-1100, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.031, 19.27.074, and chapters 19.27 and 34.05 RCW. 07-01-093, § 51-54-1100, filed 12/19/06, effective 7/1/07.]

WAC 51-54-2200 Chapter 22—Motor fuel-dispensing facilities and repair garages.

2202.1 Definitions.

MOTOR VEHICLE. Includes, but not limited to, a vehicle, machine, tractor, trailer or semitrailer, or any combination thereof, propelled or drawn by mechanical power and designed for use upon the highways in the transportation of passengers or property. It does not include a vehicle, locomotive or car operated exclusively on a rail or rails, or a trolley bus operated by electric power derived from a fixed overhead wire, furnishing local passenger transportation similar to street-railway service. The term "motor vehicle" also includes freight containers or cargo tanks used, or intended for use, in connection with motor vehicles.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 10-03-100, § 51-54-2200, filed 1/20/10, effective 7/1/10.]

WAC 51-54-3300 Chapter 33—Explosives and fireworks.

3301.1 Scope. The provisions of this chapter shall govern the possession, manufacture, storage, handling, sale and use of explosives, explosive materials, and small arms ammunition. The manufacture, storage, handling, sale and use of fireworks shall be governed by chapter 70.77 RCW, and by chapter 212-17 WAC and local ordinances consistent with chapter 212-17 WAC.

EXCEPTIONS:
1. The Armed Forces of the United States, Coast Guard or National Guard.
2. Explosives in forms prescribed by the official United States Pharmacopoeia.
3. The possession, storage and use of small arms ammunition when packaged in accordance with DOT packaging requirements.
4. The possession, storage and use of not more than 1 pound (0.454 kg) of commercially manufactured sporting black powder, 20 pounds (9 kg) of smokeless powder and 10,000 small arms primers for hand loading of small arms ammunition for personal consumption.
5. The use of explosive materials by federal, state and local regulatory, law enforcement and fire agencies acting in their official capacities.
6. Special industrial explosive devices in which the aggregate contain less than 50 pounds (23 kg) of explosive materials.
7. The possession, storage and use of blank industrial-power load cartridges when packaged in accordance with DOT packaging regulations.
8. Transportation in accordance with DOT 49 CFR Parts 100-178.
9. Items preempted by federal regulations.

3301.1.1 Explosive material standard. In addition to the requirements of this chapter, NFPA 495 shall govern the manufacture, transportation, storage, sale, handling and use of explosive materials. See also chapter 70.74 RCW and chapter 296-52 WAC.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 10-03-100, § 51-54-3300, filed 1/20/10, effective 7/1/10; 04-01-105, § 51-54-3300, filed 12/17/03, effective 7/1/04.]

WAC 51-54-3400 Chapter 34—Flammable and combustible liquids.

3404.2.11 Underground tanks. Underground storage of flammable and combustible liquids in tanks shall comply with Section 3404.2 and Sections 3404.2.11.1 through 3404.2.11.5.2. Corrosion protection shall comply with WAC 173-360-305.

3405.4.1 Unit with a capacity of 60 gallons or less. Solvent distillation units used to recycle Class I, II or III-A liquids having a distillation chamber capacity of 60 gallons or less shall be listed, labeled and installed in accordance with Section 3405.4 and UL 2208.

EXCEPTIONS:
1. Solvent distillation units installed in dry-cleaning plants in accordance with Chapter 12.
2. Solvent distillation units used in continuous through-put industrial processes where the source of heat is remotely supplied using steam, hot water, oil or other heat transfer fluids, the temperature of which is below the autoignition point of the solvent.
3. Approved research, testing and experimental processes.

3406.5.4.5 Commercial, industrial, governmental or manufacturing. Dispensing of Class II and III motor vehicle fuel from tank vehicles into the fuel tanks of motor vehicles located at commercial, industrial, governmental or manufacturing establishments is allowed where permitted, provided such dispensing operations are conducted in accordance with the following: (Those sections not noted here remain unchanged.)

12. Fuel delivery vehicles shall be equipped with spill clean-up supplies in accordance with the department of ecology's Source Control Best Management Practices. Such supplies shall be readily available for deployment by the operator at all times and include nonwater absorbents capable of absorbing 15 gallons (56.76 L) of diesel fuel, storm drain plug or cover kit, a nonwater absorbent containment boom of a minimum 10-foot-long (3038 mm) length with a 12-gallon (45.41 L) absorbent capacity, a nonmetallic shovel, and two 5-gallon (19 L) buckets with lids.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 10-03-100, § 51-54-3400, filed 1/20/10, effective 7/1/10; 04-01-105, § 51-54-3400, filed 12/17/03, effective 7/1/04.]

WAC 51-54-3800 Chapter 38—Liquefied petroleum gases.

Section 3801.1 Scope. Storage, handling and transportation of liquefied petroleum gas (LP-gas) and the installation of LP-gas equipment pertinent to systems for such uses shall comply with this chapter and NFPA 58. Properties of LP-gas shall be determined in accordance with Appendix B of NFPA 58.

EXCEPTION: The use and storage of listed propane fired barbeque grills on R-2 decks and balconies with an approved container not exceeding a water capacity of 20 pounds (9 kg) that maintain a minimum clearance of 18 inches on all sides, unless listed for lesser clearances.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 10-03-100, § 51-54-3800, filed 1/20/10, effective 7/1/10.]

WAC 51-54-4500 Chapter 45—Marinas.

SECTION 4501

4501.1.2 Permits. For permits to operate marine motor fuel-dispensing stations, application of flammable or combustible finishes, and hot works, see Section 105.6.

SECTION 4502 DEFINITIONS

4502.1 Definitions. The following words and terms shall, for the purpose of this chapter and as used elsewhere in this code, have the meanings shown herein.

COVERED BOAT MOORAGE is a pier or system of floating or fixed access ways to which vessels on water may be secured and any portion of which are covered by a roof.

GRAVITY-OPERATED DROP OUT VENTS are automatic smoke and heat vents containing heat-sensitive glazing designed to shrink and drop out of the vent openings when exposed to fire.

SECTION 4504 FIRE-PROTECTION EQUIPMENT

4504.2 Standpipes. Marinas shall be equipped throughout with Class I manual, dry standpipe systems in accordance with NFPA 303. Systems shall be provided with outlets located such that no point on the marina pier or float system exceeds 150 feet from a standpipe outlet.

4504.3 Access and water supply. Piers and wharves shall be provided with fire apparatus access roads and water-supply systems with on-site fire hydrants when required and approved by the fire code official. At least one fire hydrant capable of providing the required fire flow shall be provided within an approved distance of standpipe supply connections.

4504.4 Portable fire extinguishers. One 4A40BC fire extinguisher shall be provided at each standpipe outlet. Additional fire extinguishers, suitable for the hazards involved, shall be provided and maintained in accordance with Section 906.

4504.7 Smoke and heat vents. Approved automatic smoke and heat vents shall be provided in covered boat moorage areas exceeding 2,500 sq. ft. (232 m^2) in area, excluding roof overhangs.

EXCEPTION: Smoke and heat vents are not required in areas protected by automatic sprinklers.

4504.7.1 Design and installation. Where smoke and heat vents are required they shall be installed near the roof peak, evenly distributed and arranged so that at least one vent is over each covered berth. The effective vent area shall be calculated using a ratio of one square foot of vent to every fifteen square feet of covered berth area (1:15). Each vent shall provide a minimum opening size of 4 ft. x 4 ft.

4504.7.1.1 Smoke and heat vents. Smoke and heat vents shall operate automatically by actuation of a heat-responsive device rated at between 100ºF (56ºC) above ambient.

EXCEPTION: Gravity-operated drop out vents.

4504.7.1.2 Gravity-operated drop out vents. Gravity-operated drop out vents shall fully open within 5 minutes after the vent cavity is exposed to a simulated fire represented by a

time-temperature gradient that reaches an air temperature of 500ºF (260ºC) within 5 minutes.

4504.8 Draft curtains. Draft curtains shall be provided in covered boat moorage areas exceeding 2,500 sq. ft. (232 m^2) in area, excluding roof overhangs.

EXCEPTION: Draft curtains are not required in areas protected by automatic sprinklers.

4504.8.1 Draft curtain construction. Draft curtains shall be constructed of sheet metal, gypsum board or other approved materials that provide equivalent performance to resist the passage of smoke. Joints and connections shall be smoke tight.

4504.8.2 Draft curtain location and depth. The maximum area protected by draft curtains shall not exceed 2,000 sq. ft. (186 m^2) or two slips or berths, whichever is smaller. Draft curtains shall not extend past the piling line. Draft curtains shall have a minimum depth of 4 feet and shall not extend closer than 8 feet (2438 mm) to the walking surface of the pier.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 10-03-100, § 51-54-4500, filed 1/20/10, effective 7/1/10.]

WAC 51-54-4600 Chapter 46—Existing buildings.

CHAPTER 46 CONSTRUCTION REQUIREMENTS FOR EXISTING BUILDINGS

SECTION 4601 GENERAL

4601.1 Scope. The provisions of this chapter shall apply to existing buildings constructed prior to the adoption of this Code.

4601.2 Intent. The intent of this chapter is to provide a minimum degree of fire and life safety to persons occupying buildings by providing for alterations to such existing buildings that do not comply with the minimum requirements of the International Building Code.

4601.3 Permits. Permits shall be required as set forth in Section 105.7 and the International Building Code and this Code.

4601.4 Owner notification. Where a building is found to be in noncompliance, the fire code official shall duly notify the owner of the building. Upon receipt of such notice, the owner shall, subject to the following time limits, take necessary actions to comply with the provisions of this chapter.

4601.4.1 Construction documents. Construction documents for the necessary alterations shall be completed within a time schedule approved by the fire code official.

4601.4.2 Completion of work. Work on the required alterations to the building shall be completed within a time schedule approved by the fire code official.

4601.4.3 Extension of time. The fire code official is authorized to grant necessary extensions of time when it can be shown that the specified time periods are not physically practical or pose an undue hardship. The granting of an extension of time for compliance shall be based on the showing of good cause and subject to the filing of an acceptable systematic plan of correction with the fire code official.

SECTION 4602 DEFINITIONS

4602.1 Definitions. The following word and term shall, for the purpose of this chapter and as used elsewhere in this Code, have the meaning shown herein.

EXISTING. Buildings, facilities or conditions that are already in existence, constructed or officially authorized prior to the adoption of this Code.

SECTION 4603 FIRE SAFETY REQUIREMENTS FOR EXISTING BUILDINGS

4603.1 Required construction. Existing buildings shall comply with not less than the minimum provisions specified in Table 4603.1 and as further enumerated in Sections 4603.2 through 4603.7.3.

The provisions of this chapter shall not be construed to allow the elimination of fire protection systems or a reduction in the level of fire safety provided in buildings constructed in accordance with previously adopted codes.

EXCEPTION: Group U occupancies.

4603.2 Elevator operation. Existing elevators with a travel distance of 25 feet (7620 mm) or more above or below the main floor or other level of a building and intended to serve the needs of emergency personnel for firefighting or rescue purposes shall be provided with emergency operation in accordance with ASME A17.3.

4603.3 Vertical openings. Interior vertical shafts, including, but not limited to, stairways, elevator hoistways, service and utility shafts, that connect two or more stories of a building, shall be enclosed or protected as specified in Sections 4603.3.1 through 4603.3.7.

4603.3.1 Group I occupancies. In Group I occupancies, interior vertical openings connecting two or more stories shall be protected with 1-hour fire-resistance-rated construction.

4603.3.2 Three to five stories. In other than Group I occupancies, interior vertical openings connecting three to five stories shall be protected by either 1-hour fire-resistance-rated construction or an automatic sprinkler system shall be installed throughout the building in accordance with Section 903.3.1.1 or 903.3.1.2.

EXCEPTIONS:
1. Vertical opening protection is not required for Group R-3 occupancies.
2. Vertical opening protection is not required for open parking garages and ramps.
3. Vertical opening protection is not required for escalators.

4603.3.3 More than five stories. In other than Group I occupancies, interior vertical openings connecting more than five stories shall be protected by 1-hour fire-resistance-rated construction.

EXCEPTIONS:
1. Vertical opening protection is not required for Group R-3 occupancies.
2. Vertical opening protection is not required for open parking garages and ramps.
3. Vertical opening protection is not required for escalators.

TABLE 4603.1
OCCUPANCY AND USE REQUIREMENTS

	USE			OCCUPANCY CLASSIFICATION																	
SECTION	HIgh Rise	Atrium and covered mall	Underground building	A	B	E	F	H-1	H-2	H-3	H-4	H-5	I-1	I-2	I-3	I-4	M	R-1	R-2	R-3	R-4	S
4603.2	R		R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
4603.3.1	R		R										R	R	R	R						
4603.3.2	R		R	R	R	R	R	R	R	R	R	R					R	R	R		R	R
4603.3.3	R		R	R	R	R	R	R	R	R	R	R					R	R	R		R	R
4603.3.4		R																				
4603.3.5					R												R					
4603.3.6				R		R	R	R	R	R	R	R	R	R	R	R		R	R	R	R	R
4603.3.7				R		R	R	R	R	R	R	R	R	R	R	R		R	R	R	R	R
4603.4				R			R		R	R							R					
4603.5	R		R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R		R	R
4603.6.1						R																
4603.6.2													R									
4603.6.3														R								
4603.6.4															R							
4603.6.5																		R				
4603.6.6																			R			
4603.6.7																					R	
4603.7																		R	R	R	R	
4604.4	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R

R = The building is required to comply.

4603.3.4 Atriums and covered malls. In other than Group I occupancies, interior vertical openings in a covered mall building or a building with an atrium shall be protected by either 1-hour fire-resistance-rated construction or an automatic sprinkler system shall be installed throughout the building in accordance with Section 903.3.1.1 or 903.3.1.2.

EXCEPTIONS: 1. Vertical opening protection is not required for Group R-3 occupancies.
2. Vertical opening protection is not required for open parking garages and ramps.

4603.3.5 Escalators in Group B and M occupancies. Escalators creating vertical openings connecting any number of stories shall be protected by either 1-hour fire-resistance-rated construction or an automatic fire sprinkler system in accordance with Section 903.3.1.1 installed throughout the building, with a draft curtain and closely spaced sprinklers around the escalator opening.

4603.3.6 Escalators connecting four or fewer stories. In other than Group B and M occupancies, escalators creating vertical openings connecting four or fewer stories shall be protected by either 1-hour fire-resistance-rated construction or an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2 shall be installed throughout the building, and a draft curtain with closely spaced sprinklers shall be installed around the escalator opening.

4603.3.7 Escalators connecting more than four stories. In other than Group B and M occupancies, escalators creating vertical openings connecting five or more stories shall be protected by 1-hour fire-resistance-rated construction.

4603.4 Sprinkler systems. An automatic sprinkler system shall be provided in all existing buildings in accordance with Sections 4603.4.1 and 4603.4.2.

4603.4.1 Pyroxylin plastics. An automatic sprinkler system shall be provided throughout existing buildings where cellulose nitrate film or pyroxylin plastics are manufactured, stored or handled in quantities exceeding 100 pounds (45 kg). Vaults located within buildings for the storage of raw pyroxylin shall be protected with an approved automatic sprinkler system capable of discharging 1.66 gallons per minute per square foot (68 L/min/m^2) over the area of the vault.

4603.4.2 Group I-2. An automatic sprinkler system shall be provided throughout existing Group I-2 fire areas. The sprinkler system shall be provided throughout the floor where the Group I-2 occupancy is located, and in all floors between the Group I-2 occupancy and the level of exit discharge.

4603.4.3 Nightclub. An automatic sprinkler system shall be provided throughout Group A-2 nightclubs as defined in this code. No building shall be constructed for, used for, or converted to occupancy as a nightclub except in accordance with this section.

4603.5 Standpipes. Existing structures with occupied floors located more than 50 feet (15,240 mm) above or below the lowest level of fire department vehicle access shall be equipped with standpipes installed in accordance with Section 905. The standpipes shall have an approved fire department connection with hose connections at each floor level above or below the lowest level of fire department access. The fire code official is authorized to approve the installation of manual standpipe systems to achieve compliance with this section where the responding fire department is capable of providing the required hose flow at the highest standpipe outlet.

4603.6 Fire alarm systems. An approved fire alarm system shall be installed in existing buildings and structures in accordance with Sections 4603.6.1 through 4603.6.7 and provide occupant notification in accordance with Section 907.6 unless other requirements are provided by other sections of this code.

EXCEPTION: Occupancies with an existing, previously approved fire alarm system.

4603.6.1 Group E. A fire alarm system shall be installed in existing Group E occupancies in accordance with Section 907.2.3.

EXCEPTIONS: 1. A manual fire alarm system is not required in a building with a maximum area of 1,000 square feet (93 m^2) that contains a single classroom and is located no closer than 50 feet (15,240 mm) from another building.
2. A manual fire alarm system is not required in Group E occupancies with an occupant load less than 50.

4603.6.2 Group I-1. An automatic fire alarm system shall be installed in existing Group I-1 residential care/assisted living facilities in accordance with Section 907.2.6.1.

EXCEPTIONS: 1. Manual fire alarm boxes in resident or patient sleeping areas shall not be required at exits if located at all nurses' control stations or other constantly attended staff locations, provided such stations are visible and continuously accessible and that travel distances required in Section 907.5.2 are not exceeded.
2. Where each sleeping room has a means of egress door opening directly to an exterior egress balcony that leads directly to the exits in accordance with WAC 51-50-1019, and the building is not more than three stories in height.

4603.6.3 Group I-2. An automatic fire alarm system shall be installed in existing Group I-2 occupancies in accordance with Section 907.2.6.2.

EXCEPTION: Manual fire alarm boxes in resident or patient sleeping areas shall not be required at exits if located at all nurses' control stations or other constantly attended staff locations, provided such stations are visible and continuously accessible and that travel distances required in Section 907.5.2.1 are not exceeded.

4603.6.4 Group I-3. An automatic and manual fire alarm system shall be installed in existing Group I-3 occupancies in accordance with Section 907.2.6.3.

4603.6.5 Group R-1. A fire alarm system and smoke alarms shall be installed in existing Group R-1 occupancies in accordance with Sections 4603.6.5.1 through 4603.6.5.2.1.

4603.6.5.1 Group R-1 hotel and motel manual fire alarm system. A manual fire alarm system that activates the occupant notification system in accordance with Section 907.6 shall be installed in existing Group R-1 hotels and motels more than three stories or with more than 20 sleeping units.

EXCEPTIONS: 1. Buildings less than two stories in height where all sleeping units, attics and crawl spaces are separated by 1-hour fire-resistance-rated construction and each sleeping unit has direct access to a public way, exit court or yard.
2. Manual fire alarm boxes are not required throughout the building when the following conditions are met:
2.1. The building is equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2;
2.2. The notification appliances will activate upon sprinkler water flow; and
2.3. At least one manual fire alarm box is installed at an approved location.

4603.6.5.1.1 Group R-1 hotel and motel automatic smoke detection system. An automatic smoke detection system that activates the occupant notification system in accordance with Section 907.6 shall be installed in existing Group R-1 hotels and motels throughout all interior corridors serving sleeping rooms not equipped with an approved, supervised sprinkler system installed in accordance with WAC 51-50-0903.

EXCEPTION: An automatic smoke detection system is not required in buildings that do not have interior corridors serving sleeping units and where each sleeping unit has a means of egress door opening directly to an exit or to an exterior exit access that leads directly to an exit.

4603.6.5.2 Group R-1 boarding and rooming houses manual fire alarm system. A manual fire alarm system that activates the occupant notification system in accordance with Section 907.6 shall be installed in existing Group R-1 boarding and rooming houses.

EXCEPTION: Buildings less than two stories in height where all sleeping units, attics and crawl spaces are separated by 1-hour fire-resistance-rated construction and each sleeping unit has direct access to a public way, exit court or yard.

4603.6.5.2.1 Group R-1 boarding and rooming houses automatic smoke detection system. An automatic smoke detection system that activates the occupant notification system in accordance with Section 907.6 shall be installed in existing Group R-1 boarding and rooming houses throughout all interior corridors serving sleeping units not equipped with an approved, supervised sprinkler system installed in accordance with WAC 51-50-0903.

EXCEPTION: Buildings equipped with single-station smoke alarms meeting or exceeding the requirements of Section 907.2.10.1 and where the fire alarm system includes at least one manual fire alarm box per floor arranged to initiate the alarm.

4603.6.6 Group R-2. An automatic or manual fire alarm system that activates the occupant notification system in accordance with Section 907.6 shall be installed in existing Group R-2 occupancies more than three stories in height or with more than 16 dwelling or sleeping units.

EXCEPTIONS: 1. Where each living unit is separated from other contiguous living units by fire barriers having a fire-resistance rating of not less than 0.75 hour, and where each living unit has either its own independent exit or its own independent stairway or ramp discharging at grade.
2. A separate fire alarm system is not required in buildings that are equipped throughout with an approved supervised automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2 and having a local alarm to notify all occupants.
3. A fire alarm system is not required in buildings that do not have interior corridors serving dwelling units and are protected by an approved automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2, provided that dwelling units either have a means of egress door opening directly to an exterior exit access that leads directly to the exits or are served by open-ended corridors designed in accordance with Section 1023.6, Exception 4.

4603.6.7 Group R-4. This section not adopted.

EXCEPTIONS: 1. Where there are interconnected smoke alarms meeting the requirements of Section 907.2.11 and there is at least one manual fire alarm box per floor arranged to continuously sound the smoke alarms.
2. Other manually activated, continuously sounding alarms approved by the fire code official.

4603.7 Single and multiple-station smoke alarms. Single and multiple-station smoke alarms shall be installed in existing Group R occupancies and in dwellings not classified as Group R occupancies in accordance with Sections 4603.7.1 through 4603.7.3.

4603.7.1 Where required. Existing Group R occupancies and dwellings not classified as Group R occupancies not already provided with single-station smoke alarms shall be provided with single-station smoke alarms. Installation shall be in accordance with Section 907.2.10, except as provided in Sections 4603.7.2 and 4603.7.3.

4603.7.2 Interconnection. Where more than one smoke alarm is required to be installed within an individual dwelling or sleeping unit, the smoke alarms shall be interconnected in such a manner that the activation of one alarm will activate all of the alarms in the individual unit. The alarm shall be clearly audible in all bedrooms over background noise levels with all intervening doors closed.

EXCEPTIONS:
1. Interconnection is not required in buildings that are not undergoing alterations, repairs or construction of any kind.
2. Smoke alarms in existing areas are not required to be interconnected where alterations or repairs do not result in the removal of interior wall or ceiling finishes exposing the structure, unless there is an attic, crawl space or basement available which could provide access for interconnection without the removal of interior finishes.

4603.7.3 Power source. Single-station smoke alarms shall receive their primary power from the building wiring provided that such wiring is served from a commercial source and shall be equipped with a battery backup. Smoke alarms with integral strobes that are not equipped with battery backup shall be connected to an emergency electrical system. Smoke alarms shall emit a signal when the batteries are low. Wiring shall be permanent and without a disconnecting switch other than as required for overcurrent protection.

EXCEPTIONS:
1. Smoke alarms are permitted to be solely battery operated in existing buildings where no construction is taking place.
2. Smoke alarms are permitted to be solely battery operated in buildings that are not served from a commercial power source.
3. Smoke alarms are permitted to be solely battery operated in existing areas of buildings undergoing alterations or repairs that do not result in the removal of interior walls or ceiling finishes exposing the structure, unless there is an attic, crawl space or basement available which could provide access for building wiring without the removal of interior finishes.

SECTION 4604 MEANS OF EGRESS FOR EXISTING BUILDINGS

4604.1 General. Means of egress in existing buildings shall comply with Section 1030 and 4604.2 through 4604.23.

EXCEPTION: Means of egress conforming to the requirements of the building code under which they were constructed and Section 1030 shall not be required to comply with 4604.2 through 4604.21.

4604.1.1 Evaluation. Existing buildings that were not required to comply with a building code at the time of construction, and that constitute a distinct hazard to life as determined by the fire official, shall comply with the minimum egress requirements when specified in Table 4603.1 as further enumerated in Sections 4604.2 through 4604.23. The fire official shall notify the building owner in writing of the distinct hazard and, in addition shall have the authority to require a life safety evaluation be prepared, consistent with the requirements of Section 104.7.2. The life safety evaluation shall identify any changes to the means of egress that are necessary to provide safe egress to occupants and shall be subject to review and approval by the fire and building code officials. The building shall be modified to comply with the recommendations set forth in the approved evaluation.

4604.2 Elevators, escalators and moving walks. Elevators, escalators and moving walks shall not be used as a component of a required means of egress.

EXCEPTIONS:
1. Elevators used as an accessible means of egress where allowed by Section 1007.4.
2. Previously approved escalators and moving walks in existing buildings.

4604.3 Exit sign illumination. Exit signs shall be internally or externally illuminated. The face of an exit sign illuminated from an external source shall have an intensity of not less than 5 foot-candles (54 lux). Internally illuminated signs shall provide equivalent luminance and be listed for the purpose.

EXCEPTION: Approved self-luminous signs that provide evenly illuminated letters shall have a minimum luminance of 0.06 foot-lamberts (0.21 cd/m^2).

4604.4 Power source. Where emergency illumination is required in Section 4604.5, exit signs shall be visible under emergency illumination conditions.

EXCEPTION: Approved signs that provide continuous illumination independent of external power sources are not required to be connected to an emergency electrical system.

4604.5 Illumination emergency power. The power supply for means of egress illumination shall normally be provided by the premises' electrical supply. In the event of power supply failure, illumination shall be automatically provided from an emergency system for the following occupancies where such occupancies require two or more means of egress:

1. Group A having 50 or more occupants.

EXCEPTION: Assembly occupancies used exclusively as a place of worship and having an occupant load of less than 300.

2. Group B buildings three or more stories in height, buildings with 100 or more occupants above or below a level of exit discharge serving the occupants or buildings with 1,000 or more total occupants.

3. Group E in interior stairs, corridors, windowless areas with student occupancy, shops and laboratories.

4. Group F having more than 100 occupants.

EXCEPTION: Buildings used only during daylight hours which are provided with windows for natural light in accordance with the International Building Code.

5. Group I.

6. Group M.

EXCEPTION: Buildings less than 3,000 square feet (279 m^2) in gross sales area on one story only, excluding mezzanines.

7. Group R-1.

EXCEPTION: Where each sleeping unit has direct access to the outside of the building at grade.

8. Group R-2.

EXCEPTION: Where each dwelling unit or sleeping unit has direct access to the outside of the building at grade.

9. Group R-4.

EXCEPTION: Where each sleeping unit has direct access to the outside of the building at ground level.

4604.5.1 Emergency power duration and installation. In other than Group I-2, the emergency power system shall provide power for not less than 60 minutes and consist of storage batteries, unit equipment or an on-site generator. In Group I-2, the emergency power system shall provide power for not less than 90 minutes and consist of storage batteries, unit equipment or an on-site generator. The installation of the

emergency power system shall be in accordance with Section 4604.

4604.6 Guards. Guards complying with this section shall be provided at the open sides of means of egress that are more than 30 inches (762 mm) above the floor or grade below.

4604.6.1 Height of guards. Guards shall form a protective barrier not less than 42 inches (1067 mm) high.

EXCEPTIONS:
1. Existing guards on the open side of stairs shall be not less than 30 inches (760 mm) high.
2. Existing guards within dwelling units shall be not less than 36 inches (910 mm) high.
3. Existing guards in assembly seating areas.

4604.6.2 Opening limitations. Open guards shall have balusters or ornamental patterns such that a 6-inch-diameter (152 mm) sphere cannot pass through any opening up to a height of 34 inches (864 mm).

EXCEPTIONS:
1. At elevated walking surfaces for access to, and use of, electrical, mechanical or plumbing systems or equipment, guards shall have balusters or be of solid materials such that a sphere with a diameter of 21 inches (533 mm) cannot pass through any opening.
2. In occupancies in Group I-3, F, H or S, the clear distance between intermediate rails measured at right angles to the rails shall not exceed 21 inches (533 mm).
3. Approved existing open guards.

4604.7 Minimum required egress width. The means of egress width shall not be less than as required by the code under which constructed but not less than as required by this section. The total width of means of egress in inches (mm) shall not be less than the total occupant load served by the means of egress multiplied by the factors in Table 4604.7 and not less than specified elsewhere in this section. Multiple means of egress shall be sized such that the loss of any one means of egress shall not reduce the available capacity to less than 50 percent of the required capacity. The maximum capacity required from any story of a building shall be maintained to the termination of the means of egress.

TABLE 4604.7
EGRESS WIDTH PER OCCUPANT SERVED

	WITHOUT SPRINKLER SYSTEM		WITH SPRINKLER SYSTEM[a]	
OCCUPANCY	Stairways (inches per occupant)	Other egress components (inches per occupant)	Stairways (inches per occupant)	Other egress components (inches per occupant)
Occupancies other than those listed below	0.3	0.2	0.2	0.15
Hazardous: H-1, H-2, H-3 and H-4	Not permitted	Not permitted	0.3	0.2
Institutional: I-2	Not permitted	Not permitted	0.3	0.2

For SI: 1 inch = 25.4 mm.
a. Buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2.

4604.8 Size of doors. The minimum width of each door opening shall be sufficient for the occupant load thereof and shall provide a clear width of not less than 28 inches (711 mm). Where this section requires a minimum clear width of 28 inches (711 mm) and a door opening includes two door leaves without a mullion, one leaf shall provide a clear opening width of 28 inches (711 mm). The maximum width of a swinging door leaf shall be 48 inches (1219 mm) nominal. Means of egress doors in an occupancy in Group I-2 used for the movement of beds shall provide a clear width not less than 41.5 inches (1054 mm). The height of doors shall not be less than 80 inches (2032 mm).

EXCEPTIONS:
1. The minimum and maximum width shall not apply to door openings that are not part of the required means of egress in occupancies in Groups R-2 and R-3.
2. Door openings to storage closets less than 10 square feet (0.93 m^2) in area shall not be limited by the minimum width.
3. Width of door leaves in revolving doors that comply with Section 1008.1.4.1 shall not be limited.
4. Door openings within a dwelling unit shall not be less than 78 inches (1981 mm) in height.
5. Exterior door openings in dwelling units, other than the required exit door, shall not be less than 76 inches (1930 mm) in height.
6. Exit access doors serving a room not larger than 70 square feet (6.5 m^2) shall be not less than 24 inches (610 mm) in door width.

4604.9 Opening force for doors. The opening force for interior side-swinging doors without closers shall not exceed a 5-pound (22 N) force. For other side-swinging, sliding and folding doors, the door latch shall release when subjected to a force of not more than 15 pounds (66 N). The door shall be set in motion when subjected to a force not exceeding 30 pounds (133 N). The door shall swing to a full open position when subjected to a force of not more than 50 pounds (222 N). Forces shall be applied to the latch side.

4604.10 Revolving doors. Revolving doors shall comply with the following:

1. A revolving door shall not be located within 10 feet (3048 mm) of the foot or top of stairs or escalators. A dispersal area shall be provided between the stairs or escalators and the revolving doors.

2. The revolutions per minute for a revolving door shall not exceed those shown in Table 4604.10.

3. Each revolving door shall have a conforming side-hinged swinging door in the same wall as the revolving door and within 10 feet (3048 mm).

EXCEPTIONS:
1. A revolving door is permitted to be used without an adjacent swinging door for street-floor elevator lobbies provided a stairway, escalator or door from other parts of the building does not discharge through the lobby and the lobby does not have any occupancy or use other than as a means of travel between elevators and a street.
2. Existing revolving doors where the number of revolving doors does not exceed the number of swinging doors within 20 feet (6096 mm).

4604.10.1 Egress component. A revolving door used as a component of a means of egress shall comply with Section 4604.10 and all of the following conditions:

1. Revolving doors shall not be given credit for more than 50 percent of the required egress capacity.

2. Each revolving door shall be credited with not more than a 50-person capacity.

3. Revolving doors shall be capable of being collapsed when a force of not more than 130 pounds (578 N) is applied within 3 inches (76 mm) of the outer edge of a wing.

4604.11 Stair dimensions for existing stairs. Existing stairs in buildings shall be permitted to remain if the rise does not exceed 8 1/4 inches (210 mm) and the run is not less than 9 inches (229 mm). Existing stairs can be rebuilt.

EXCEPTION: Other stairs approved by the fire code official.

TABLE 4604.10
REVOLVING DOOR SPEEDS

INSIDE DIAMETER	POWER-DRIVEN-TYPE SPEED CONTROL (RPM)	MANUAL-TYPE SPEED CONTROL (RPM)
6' 6"	11	12
7' 0"	10	11
7' 6"	9	11
8' 0"	9	10
8' 6"	8	9
9' 0"	8	9
9' 6"	7	8
10' 0"	7	8

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm.

4604.11.1 Dimensions for replacement stairs. The replacement of an existing stairway in a structure shall not be required to comply with the new stairway requirements of WAC 51-11-1009 where the existing space and construction will not allow a reduction in pitch or slope.

4604.12 Winders. Existing winders shall be allowed to remain in use if they have a minimum tread depth of 6 inches (152 mm) and a minimum tread depth of 9 inches (229 mm) at a point 12 inches (305 mm) from the narrowest edge.

4604.13 Circular stairways. Existing circular stairs shall be allowed to continue in use provided the minimum depth of tread is 10 inches (254 mm) and the smallest radius shall not be less than twice the width of the stairway.

4604.14 Stairway handrails. Stairways shall have handrails on at least one side. Handrails shall be located so that all portions of the stairway width required for egress capacity are within 44 inches (1118 mm) of a handrail.

EXCEPTION: Aisle stairs provided with a center handrail are not required to have additional handrails.

4604.14.1 Height. Handrail height, measured above stair tread nosings, shall be uniform, not less than 30 inches (762 mm) and not more than 42 inches (1067 mm).

4604.15 Slope of ramps. Ramp runs utilized as part of a means of egress shall have a running slope not steeper than one unit vertical in 10 units horizontal (10 percent slope). The slope of other ramps shall not be steeper than one unit vertical in 8 units horizontal (12.5 percent slope).

4604.16 Width of ramps. Existing ramps are permitted to have a minimum width of 30 inches (762 mm) but not less than the width required for the number of occupants served as determined by Section 1005.1.

4604.17 Fire escape stairs. Fire escape stairs shall comply with Sections 4604.17.1 through 4604.17.7.

4604.17.1 Existing means of egress. Fire escape stairs shall be permitted in existing buildings but shall not constitute more than 50 percent of the required exit capacity.

4604.17.2 Protection of openings. Openings within 10 feet (3048 mm) of fire escape stairs shall be protected by fire door assemblies having a minimum 3/4-hour fire-resistance rating.

EXCEPTION: In buildings equipped throughout with an approved automatic sprinkler system, opening protection is not required.

4604.17.3 Dimensions. Fire escape stairs shall meet the minimum width, capacity, riser height and tread depth as specified in Section 4604.10.

4604.17.4 Access. Access to a fire escape from a corridor shall not be through an intervening room. Access to a fire escape stair shall be from a door or window meeting the criteria of Section 1005.1. Access to a fire escape stair shall be directly to a balcony, landing or platform. These shall be no higher than the floor or window sill level and no lower than 8 inches (203 mm) below the floor level or 18 inches (457 mm) below the window sill.

4604.17.5 Materials and strength. Components of fire escape stairs shall be constructed of noncombustible materials. Fire escape stairs and balconies shall support the dead load plus a live load of not less than 100 pounds per square foot (4.78 kN/m^2). Fire escape stairs and balconies shall be provided with a top and intermediate handrail on each side. The fire code official is authorized to require testing or other satisfactory evidence that an existing fire escape stair meets the requirements of this section.

4604.17.6 Termination. The lowest balcony shall not be more than 18 feet (5486 mm) from the ground. Fire escape stairs shall extend to the ground or be provided with counterbalanced stairs reaching the ground.

EXCEPTION: For fire escape stairs serving 10 or fewer occupants, an approved fire escape ladder is allowed to serve as the termination.

4604.17.7 Maintenance. Fire escapes shall be kept clear and unobstructed at all times and shall be maintained in good working order.

4604.18 Corridors. Corridors serving an occupant load greater than 30 and the openings therein shall provide an effective barrier to resist the movement of smoke. Transoms, louvers, doors and other openings shall be kept closed or self-closing.

EXCEPTIONS: 1. Corridors in occupancies other than in Group H, which are equipped throughout with an approved automatic sprinkler system.

2. Patient room doors in corridors in occupancies in Group I-2 where smoke barriers are provided in accordance with the International Building Code.

3. Corridors in occupancies in Group E where each room utilized for instruction or assembly has at least one-half of the required means of egress doors opening directly to the exterior of the building at ground level.
4. Corridors that are in accordance with the International Building Code.

4604.18.1 Corridor openings. Openings in corridor walls shall comply with the requirements of the International Building Code.

EXCEPTIONS:
1. Where 20-minute fire door assemblies are required, solid wood doors at least 1.75 inches (44 mm) thick or insulated steel doors are allowed.
2. Openings protected with fixed wire glass set in steel frames.
3. Openings covered with 0.5-inch (12.7 mm) gypsum wallboard or 0.75-inch (19.1 mm) plywood on the room side.
4. Opening protection is not required when the building is equipped throughout with an approved automatic sprinkler system.

4604.18.2 Dead ends. Where more than one exit or exit access doorway is required, the exit access shall be arranged such that dead ends do not exceed the limits specified in Table 4604.17.2.

EXCEPTION: A dead-end passageway or corridor shall not be limited in length where the length of the dead-end passageway or corridor is less than 2.5 times the least width of the dead-end passageway or corridor.

4604.18.3 Exit access travel distance. Exits shall be located so that the maximum length of exit access travel, measured from the most remote point to an approved exit along the natural and unobstructed path of egress travel, does not exceed the distances given in Table 4604.17.2.

4604.18.4 Common path of egress travel. The common path of egress travel shall not exceed the distances given in Table 4604.18.2.

4604.19 Stairway discharge identification. A stairway in an exit enclosure which continues below its level of exit discharge shall be arranged and marked to make the direction of egress to a public way readily identifiable.

EXCEPTION: Stairs that continue one-half story beyond their levels of exit discharge need not be provided with barriers where the exit discharge is obvious.

4604.20 Exterior stairway protection. Exterior exit stairs shall be separated from the interior of the building as required in Section 1026.6. Openings shall be limited to those necessary for egress from normally occupied spaces.

EXCEPTIONS:
1. Separation from the interior of the building is not required for buildings that are two stories or less above grade where the level of exit discharge serving such occupancies is the first story above grade.
2. Separation from the interior of the building is not required where the exterior stairway is served by an exterior balcony that connects two remote exterior stairways or other approved exits, with a perimeter that is not less than 50 percent open. To be considered open, the opening shall be a minimum of 50 percent of the height of the enclosing wall, with the top of the opening not less than 7 feet (2134 mm) above the top of the balcony.
3. Separation from the interior of the building is not required for an exterior stairway located in a building or structure that is permitted to have unenclosed interior stairways in accordance with Section 1022.
4. Separation from the interior of the building is not required for exterior stairways connected to open-ended corridors, provided that:
4.1. The building, including corridors and stairs, is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2.
4.2. The open-ended corridors comply with Section 1018.
4.3. The open-ended corridors are connected on each end to an exterior exit stairway complying with Section 1026.
4.4. At any location in an open-ended corridor where a change of direction exceeding 45 degrees occurs, a clear opening of not less than 35 square feet (3 m^2) or an exterior stairway shall be provided. Where clear openings are provided, they shall be located so as to minimize the accumulation of smoke or toxic gases.

TABLE 4604.18.2
COMMON PATH, DEAD-END AND TRAVEL DISTANCE LIMITS (by occupancy)

OCCUPANCY	COMMON PATH LIMIT		DEAD-END LIMIT		TRAVEL DISTANCE LIMIT	
	Unsprinklered (feet)	Sprinklered (feet)	Unsprinklered (feet)	Sprinklered (feet)	Unsprinklered (feet)	Sprinklered (feet)
Group A	20/75[a]	20/75[a]	20[b]	20[b]	200	250
Group B	75	100	50	50	200	250
Group E	75	75	20	50	200	250
Group F-1, S-1[d]	75	100	50	50	200	250
Group F-2, S-2[d]	75	100	50	50	300	400
Group H-1	25	25	0	0	75	75
Group H-2	50	100	0	0	75	100
Group H-3	50	100	20	20	100	150
Group H-4	75	75	20	20	150	175
Group H-5	75	75	20	20	150	200
Group I-1	75	75	20	50	200	250
Group I-2 (Health Care)	NR[e]	NR[e]	NR	NR	150	200[c]
Group I-3 (Detention and Correctional—Use Conditions II, III, IV, V)	100	100	NR	NR	150[c]	200[c]
Group I-4 (Day Care Centers)	NR	NR	20	20	200	250
Group M (Covered Mall)	75	100	50	50	200	400
Group M (Mercantile)	75	100	50	50	200	250
Group R-1 (Hotels)	75	75	50	50	200	250
Group R-2 (Apartments)	75	75	50	50	200	250
Group R-3 (One- and Two-Family)	NR	NR	NR	NR	NR	NR

OCCUPANCY	COMMON PATH LIMIT		DEAD-END LIMIT		TRAVEL DISTANCE LIMIT	
	Unsprinklered (feet)	Sprinklered (feet)	Unsprinklered (feet)	Sprinklered (feet)	Unsprinklered (feet)	Sprinklered (feet)
Group R-4 (Residential Care/Assisted Living)	NR	NR	NR	NR	NR	NR
Group U	75	75	20	50	200	250

For SI: 1 foot = 304.8 mm.

a. 20 feet for common path serving 50 or more persons; 75 feet for common path serving less than 50 persons.

b. See Section 1028.9.5 for dead-end aisles in Group A occupancies.

c. This dimension is for the total travel distance, assuming incremental portions have fully utilized their allowable maximums. For travel distance within the room, and from the room exit access door to the exit, see the appropriate occupancy chapter.

d. See the International Building Code for special requirements on spacing of doors in aircraft hangars.

e. Any patient sleeping room, or any suite that includes patient sleeping rooms, of more than 1,000 square feet (93 m^2) shall have at least two exit access doors placed a distance apart equal to not less than one-third of the length of the maximum overall diagonal dimension of the patient sleeping room or suite to be served, measured in a straight line between exit access doors.

NR = No requirements.

4604.21 Minimum aisle width. The minimum clear width of aisles shall be:

1. Forty-two inches (1067 mm) for aisle stairs having seating on each side.

EXCEPTION: Thirty-six inches (914 mm) where the aisle serves less than 50 seats.

2. Thirty-six inches (914 mm) for stepped aisles having seating on only one side.

EXCEPTION: Thirty inches (760 mm) for catchment areas serving not more than 60 seats.

3. Twenty inches (508 mm) between a stepped aisle handrail or guard and seating when the aisle is subdivided by the handrail.

4. Forty-two inches (1067 mm) for level or ramped aisles having seating on both sides.

EXCEPTION: Thirty-six inches (914 mm) where the aisle serves less than 50 seats.

5. Thirty-six inches (914 mm) for level or ramped aisles having seating on only one side.

EXCEPTION: Thirty inches (760 mm) for catchment areas serving not more than 60 seats.

6. Twenty-three inches (584 mm) between a stepped stair handrail and seating where an aisle does not serve more than five rows on one side.

4604.22 Stairway floor number signs. Existing stairs shall be marked in accordance with Section 1022.8.

4604.23 Egress path markings. Existing buildings of Group A, B, E, I, M and R-1 having occupied floors located more than 75 feet (22,860 mm) above the lowest level of fire department vehicle access shall be provided with luminous egress path markings in accordance with Section 1024.

EXCEPTION: Open, unenclosed stairwells in historic buildings designated as historic under a state or local historic preservation program.

SECTION 4605 REQUIREMENTS FOR OUTDOOR OPERATIONS

4605.1 Tire storage yards. Existing tire storage yards shall be provided with fire apparatus access roads in accordance with Sections 4605.1.1 and 4605.1.2.

4605.1.1 Access to piles. Access roadways shall be within 150 feet (45,720 mm) of any point in the storage yard where storage piles are located, at least 20 feet (6096 mm) from any storage pile.

4605.1.2 Location within piles. Fire apparatus access roads shall be located within all pile clearances identified in Section 2505.4 and within all fire breaks required in Section 2505.5.

[Statutory Authority: Chapter 19.27 RCW. 10-24-059, § 51-54-4600, filed 11/29/10, effective 7/1/11. Statutory Authority: RCW 19.27.031 and 19.27.074. 10-03-100, § 51-54-4600, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.031, 19.27.074, and chapters 19.27 and 34.05 RCW. 07-01-093, § 51-54-4600, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.020, 19.27.031, 19.27.074 and chapters 19.27 and 34.05 RCW. 05-01-016, § 51-54-4600, filed 12/2/04, effective 7/1/05.]

WAC 51-54-4700 Chapter 47—Referenced standards.

NFPA 9607 Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations. 609.3

[Statutory Authority: RCW 19.27.031 and 19.27.074. 10-03-100, § 51-54-4700, filed 1/20/10, effective 7/1/10.]

WAC 51-54-4800 Appendix K—Wildland and Urban Interface Code.

K101.5 Additions or alterations. Additions or alterations may be made to any building or structure without requiring the existing building or structure to comply with all of the requirements of this code, provided the addition or alteration conforms to that required for a new building or structure.

EXCEPTION: Provisions of this code that specifically apply to existing conditions are retroactive. See Sections 402.3, 601.1 and Appendix A.

Additions or alterations shall not cause the existing building or structure to become unsafe. An unsafe condition shall be deemed to have been created if an addition or alteration will cause the existing building or structure to become structurally unsafe or overloaded; will not provide adequate access in compliance with the provisions of this code or will obstruct existing exits or access; will create a fire hazard; will reduce required fire resistance or will otherwise create conditions dangerous to human life.

K108.3 Site plan. In addition to the requirements for plans in the *International Building Code*, the code official may require site plans which include topography, width and percent of grade of access roads, landscape and vegetation details, locations of structures or building envelopes, existing or proposed overhead utilities, occupancy classification of buildings, types of ignition resistant construction of build-

ings, structures and their appendages, roof classification of buildings, and site water supply systems. The code official is authorized to waive or modify the requirement for a site plan.

K108.4 Vegetation management plans. When required by the code official or when utilized by the permit applicant pursuant to Section 502, vegetation management plans shall be prepared and shall be submitted to the code official for review and approval as part of the plans required for a permit. See Appendix B.

K108.7 Vicinity plan. When required by the code official, the requirements for site plans shall include details regarding the vicinity within 300 feet (91, 440 mm) of property lines, including other structures, slope, vegetation, fuel breaks, water supply systems and access roads.

K402.1.1 Access. New subdivisions, as determined by this jurisdiction, shall be provided with fire apparatus access roads in accordance with the *International Fire Code*.

K402.1.2 Water supply. New subdivisions as determined by this jurisdiction shall be provided with water supply in accordance with the *International Fire Code*.

K402.2 Individual structures. Individual structures shall comply with Sections 402.2.1 and 402.2.2.

K402.2.1 Access. Individual structures hereafter constructed or relocated into or within wildland-urban interface areas shall be provided with fire apparatus access in accordance with the *International Fire Code*.

K402.2.2 Water supply. Individual structures hereafter constructed or relocated into or within wildland-urban interface areas shall be provided with a conforming water supply in accordance with the *International Fire Code*.

EXCEPTIONS: 1. Structures constructed to meet the requirements for the class of ignition-resistant construction specified in Table 503.1 for a nonconforming water supply.

2. Buildings containing only private garages, carports, sheds and agricultural buildings with a floor area of not more than 600 square feet (56 m^2).

K402.3 Existing conditions. Existing address markers, roads and fire protection equipment shall be in accordance with the *International Fire Code*.

TABLE K503.1
IGNITION-RESISTANT CONSTRUCTION[a]

	Fire Hazard Severity					
	Moderate Hazard		High Hazard		Extreme Hazard	
	Water Supply[b]		Water Supply[b]		Water Supply[b]	
Defensible Space[c]	Conforming	Nonconforming	Conforming	Nonconforming	Conforming	Nonconforming
Nonconforming	IR 2	IR 1	IR 1	IR 1 N.C.	IR 1 N.C.	Not Permitted
Conforming	IR 3	IR 2	IR 2	IR 1	IR 1	IR 1 N.C.
1.5 x Conforming	Not Required	IR 3	IR 3	IR 2	IR 2	IR 1

a. Access shall be in accordance with Section 402.
b. Water supply shall be in accordance with Section 402.1.
IR 1 = Ignition-resistant construction in accordance with Section 504.
IR 2 = Ignition-resistant construction in accordance with Section 505.
IR 3 = Ignition-resistant construction in accordance with Section 506.
N.C. = Exterior walls shall have a fire-resistance rating of not less than 1 hour and the exterior surfaces of such walls shall be noncombustible. Usage of log wall construction is allowed.
c. Conformance based on Section 603.

K403 Access. This section not adopted.

K404 Water supply. This section not adopted.

APPENDIX B-VEGETATION MANAGEMENT PLAN - THIS APPENDIX IS ADOPTED.

APPENDIX C-FIRE DANGER RATING SYSTEM - THIS APPENDIX IS ADOPTED.

[Statutory Authority: RCW 19.27.031 and 19.27.074. 10-03-100, § 51-54-4800, filed 1/20/10, effective 7/1/10.]

Chapter 51-56 WAC

STATE BUILDING CODE ADOPTION AND AMENDMENT OF THE 2009 EDITION OF THE UNIFORM PLUMBING CODE

WAC

51-56-003 Uniform Plumbing Code.
51-56-008 Implementation.
51-56-0200 Chapter 2—Definitions.
51-56-0300 Chapter 3—General regulations.
51-56-0400 Chapter 4—Plumbing fixtures and fixture fittings.
51-56-0500 Chapter 5—Water heaters.
51-56-0600 Chapter 6—Water supply and distribution.
51-56-0700 Chapter 7—Sanitary drainage.
51-56-0900 Chapter 9—Vents.
51-56-1300 Chapter 13—Health care facilities and medical gas and vacuum systems.
51-56-1400 Chapter 14—Referenced standards.
51-56-1600 Chapter 16—Gray water systems.

WAC 51-56-003 Uniform Plumbing Code. The 2009 edition of the Uniform Plumbing Code, published by the International Association of Plumbing and Mechanical Officials, is hereby adopted by reference with the following additions, deletions and exceptions: Provided that chapters 12 and 15 of this code are not adopted. Provided further, that those requirements of the Uniform Plumbing Code relating to venting and combustion air of fuel fired appliances as found in chapter 5 and those portions of the code addressing building sewers are not adopted.

[Statutory Authority: RCW 19.27.074, 19.27.031 and chapters 19.27 and 34.05 RCW. 10-03-101, § 51-56-003, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.190, 19.27.020 and chapters 19.27 and 34.05 RCW. 07-01-094, § 51-56-003, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-110, § 51-56-003, filed 12/17/03, effective 7/1/04; 02-01-114, § 51-56-003, filed 12/18/01, effective 7/1/02.]

WAC 51-56-008 Implementation. The Uniform Plumbing Code adopted by chapter 51-56 WAC shall become effective in all counties and cities of this state on July 1, 2010, unless local government residential amendments have been approved by the state building code council.

[Statutory Authority: RCW 19.27.074, 19.27.031 and chapters 19.27 and 34.05 RCW. 10-03-101, § 51-56-008, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.190, 19.27.020 and chapters 19.27 and 34.05 RCW. 07-01-094, § 51-56-008, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-110, § 51-56-008, filed 12/17/03, effective 7/1/04; 02-01-114, § 51-56-008, filed 12/18/01, effective 7/1/02.]

WAC 51-56-0200 Chapter 2—Definitions.

205.0 Certified Backflow Assembly Tester - A person certified by the Washington state department of health under chapter 246-292 WAC to inspect (for correct installation and approval status) and test (for proper operation) approved backflow assemblies.

210.0 Hot Water - Water at a temperature exceeding or equal to 100ºF.

218.0 Plumbing System - Includes all potable water, building supply and distribution pipes, all reclaimed water systems, all plumbing fixtures and traps, all drainage and vent pipe(s), and all building drains including their respective joints and connection, devices, receptors, and appurtenances within the property lines of the premises and shall include potable water piping, potable water treating or using equipment, medical gas and medical vacuum systems, and water heaters: Provided, That no certification shall be required for the installation of a plumbing system within the property lines and outside a building.

[Statutory Authority: RCW 19.27.074, 19.27.031 and chapters 19.27 and 34.05 RCW. 10-03-101, § 51-56-0200, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.190, 19.27.020 and chapters 19.27 and 34.05 RCW. 07-01-094, § 51-56-0200, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-110, § 51-56-0200, filed 12/17/03, effective 7/1/04; 02-01-114, § 51-56-0200, filed 12/18/01, effective 7/1/02.]

WAC 51-56-0300 Chapter 3—General regulations.

301.1.3 Standards. Standards listed or referred to in this chapter or other chapters cover materials which will conform to the requirements of this code, when used in accordance with the limitations imposed in this or other chapters thereof and their listing. Where a standard covers materials of various grades, weights, quality, or configurations, there may be only a portion of the listed standard which is applicable. Design and materials for special conditions or materials not provided for herein are allowed to be used by special permission of the authority having jurisdiction after the authority having jurisdiction has been satisfied as to their adequacy in accordance with Section 301.2.

311.4 Except as hereinafter provided in Sections 908.0, 909.0, 910.0, and Appendix L, no vent pipe shall be used as a soil or waste pipe, nor shall any soil or waste pipe be used as a vent.

313.6 No water, soil, or waste pipe shall be installed or permitted outside of a building or in an exterior wall unless, where necessary, adequate provision is made to protect such pipe from freezing. All hot and cold water pipes installed outside the conditioned space shall be insulated to a minimum R-3.

313.7 All pipe penetrating floor/ceiling assemblies and fire-resistance rated walls or partitions shall be protected in accordance with the requirements of the building code.

[Statutory Authority: RCW 19.27.074, 19.27.031 and chapters 19.27 and 34.05 RCW. 10-03-101, § 51-56-0300, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.190, 19.27.020 and chapters 19.27 and 34.05 RCW. 07-01-094, § 51-56-0300, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-110, § 51-56-0300, filed 12/17/03, effective 7/1/04; 02-01-114, § 51-56-0300, filed 12/18/01, effective 7/1/02.]

WAC 51-56-0400 Chapter 4—Plumbing fixtures and fixture fittings.

402.0 Water-Conserving Fixtures and Fittings.

402.1 The purpose of this section shall be to implement water conservation performance standards in accordance with RCW 19.27.170.

402.2 Application. This section shall apply to all new construction and all remodeling involving replacement of plumbing fixtures and fittings in all residential, hotel, motel, school, industrial, commercial use, or other occupancies determined by the council to use significant quantities of water. Plumbing fixtures, fittings and appurtenances shall conform to the standards specified in this section and shall be provided with an adequate supply of potable water to flush and keep the fixtures in a clean and sanitary condition without danger of backflow or cross-connection.

402.3 Water Efficiency Standards.

402.3.1 Standards for Vitreous China Plumbing Fixtures.

402.3.1.1 The following standards shall be adopted as plumbing materials, performance standards, and labeling standards for water closets and urinals. Water closets and urinals shall meet either the ANSI/ASME standards or the CSA standard.

ANSI/ASME A112.19.2M-1998	Vitreous China Plumbing Fixtures
ANSI/ASME A112.19.6-1995	Hydraulic Requirements for Water Closets and Urinals
CSA B45	CSA Standards on Plumbing Fixtures

402.3.1.2 The maximum water use allowed in gallons per flush (gpf) or liters per flush (lpf) for any of the following water closets shall be the following:

Tank-type toilets	1.6 gpf/6.0 lpf
Flushometer-valve toilets	1.6 gpf/6.0 lpf
Flushometer-tank toilets	1.6 gpf/6.0 lpf
Electromechanical hydraulic toilets	1.6 gpf/6.0 lpf

EXCEPTIONS:
1. Water closets located in day care centers, intended for use by young children may have a maximum water use of 3.5 gallons per flush or 13.25 liters per flush.
2. Water closets with bed pan washers may have a maximum water use of 3.5 gallons per flush or 13.25 liters per flush.

3. Blow out bowls, as defined in ANSI/ASME A112.19.2M, Section 5.1.2.3 may have a maximum water use of 3.5 gallons per flush or 13.25 liters per flush.

402.3.1.3 The maximum water use allowed for any urinal shall be 1.0 gallons per flush or 3.78 liters per flush.

402.3.1.3.1 Nonwater Urinals. Nonwater urinals shall be listed and comply with the applicable standards referenced in Table 14-1. Nonwater urinals shall have a barrier liquid sealant to maintain a trap seal. Nonwater urinals shall permit the uninhibited flow of waste through the urinal to the sanitary drainage system. Nonwater urinals shall be cleaned and maintained in accordance with the manufacturer's instructions after installation. Where nonwater urinals are installed, they shall have a water distribution line rough-in to the urinal location to allow for the installation of an approved backflow prevention device in the event of a retrofit.

402.3.1.4 No urinal or water closet that operates on a continuous flow or continuous flush basis shall be permitted.

402.3.1.5 This section does not apply to fixtures installed before the effective date of this Section, that are removed and relocated to another room or area of the same building after the effective date of this Section.

402.3.2 Standards for Plumbing Fixture Fittings.

402.3.2.1 The following standards are adopted as plumbing material, performance requirements, and labeling standards for plumbing fixture fittings. Faucets, aerators, and shower heads shall meet either the ANSI/ASME standard or the CSA standard.

ANSI/ASME A112.18.1M-1996	Plumbing Fixture Fittings
CSA B125	Plumbing Fittings

402.3.2.2 The maximum water use allowed for any shower head is 2.5 gallons per minute or 9.5 liters per minute.

EXCEPTION: Emergency use showers shall be exempt from the maximum water usage rates.

402.3.2.3 The maximum water use allowed in gallons per minute (gpm) or liters per minute (lpm) for any of the following faucets and replacement aerators is the following:

Lavatory faucets	2.5 gpm/9.5 lpm
Kitchen faucets	2.5 gpm/9.5 lpm
Replacement aerators	2.5 gpm/9.5 lpm
Public lavatory faucets other than metering	0.5 gpm/1.9 lpm

402.4 Metering Valves. Lavatory faucets located in restrooms intended for use by the general public shall be equipped with a metering valve designed to close by spring or water pressure when left unattended (self-closing).

EXCEPTIONS: 1. Where designed and installed for use by persons with a disability.
2. Where installed in day care centers, for use primarily by children under 6 years of age.

402.5 Implementation.

402.5.1 The standards for water efficiency and labeling contained within Section 402.3 shall be in effect as of July 1, 1993, as provided in RCW 19.27.170 and amended July 1, 1998.

402.5.2 No individual, public or private corporation, firm, political subdivision, government agency, or other legal entity, may, for purposes of use in the state of Washington, distribute, sell, offer for sale, import, install, or approve for installation any plumbing fixtures or fittings unless the fixtures or fittings meet the standards as provided for in this Section.

407.5 Setting. Fixtures shall be set level and in proper alignment with reference to adjacent walls. No water closet or bidet shall be set closer than fifteen (15) inches (381 mm) from its center to any side wall or obstruction nor closer than thirty (30) inches (762 mm) center to center to any similar fixture. The clear space in front of any water closet or bidet shall be not less than twenty-one (21) inches (533 mm). No urinal shall be set closer than twelve (12) inches (305 mm) from its center to any side wall or partition nor closer than twenty-four (24) inches (610 mm) center to center.

EXCEPTION: The installation of paper dispensers or accessibility grab bars shall not be considered obstructions.

411.2 Location of Floor Drains. Floor drains shall be installed in the following areas:

411.2.1 Toilet rooms containing two (2) or more water closets or a combination of one (1) water closet and one (1) urinal, except in a dwelling unit. The floor shall slope toward the floor drains.

411.2.2 Laundry rooms in commercial buildings and common laundry facilities in multifamily dwelling buildings.

411.7 Shower compartments, regardless of shape, shall have a minimum finished interior of nine hundred (900) square inches (0.58 m^2) and shall also be capable of encompassing a thirty inch (762 mm) circle. The minimum required area and dimensions shall be measured at a height equal to the top of the threshold and at a point tangent to its centerline. The area and dimensions shall be maintained to a point of not less than seventy (70) inches (1.778 mm) above the shower drain outlet with no protrusions other than the fixture valve or valves, shower head, soap dishes, shelves, and safety grab bars or rails. Fold-down seats in accessible shower stalls shall be permitted to protrude into the thirty (30) inch (762 mm) circle.

EXCEPTIONS: 1. Showers that are designed to comply with ICC/ANSI A117.1.
2. The minimum required area and dimension shall not apply for a shower receptor having overall dimensions of not less than thirty (30) inches (762 mm) in width and sixty (60) inches (1,524 mm) in length.

412.0 Minimum Number of Required Fixtures. For minimum number of plumbing fixtures required, see Building Code chapter 29 and Table 2902.1.

Sections 412.1 through 412.6 and Table 4-1 are not adopted.

[Statutory Authority: RCW 19.27.074, 19.27.031 and chapters 19.27 and 34.05 RCW. 10-03-101, § 51-56-0400, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.190, 19.27.020 and chapters 19.27 and 34.05 RCW. 07-01-094, § 51-56-0400, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-110, § 51-56-0400, filed 12/17/03, effective 7/1/04; 02-01-114, § 51-56-0400, filed 12/18/01, effective 7/1/02.]

WAC 51-56-0500 Chapter 5—Water heaters.

501.0 General. The regulations of this chapter shall govern the construction, location, and installation of fuel burning and other water heaters heating potable water. The minimum capacity for water heaters shall be in accordance with the first hour rating listed in Table 5-1. See the Mechanical Code for combustion air and installation of all vents and their connectors. All design, construction, and workmanship shall be in conformity with accepted engineering practices, manufacturer's installation instructions, and applicable standards and shall be of such character as to secure the results sought to be obtained by this Code. No water heater shall be hereinafter installed which does not comply in all respects with the type and model of each size thereof approved by the authority having jurisdiction. A list of accepted gas appliance standards is included in Table 14-1.

TABLE 5-1[1,3]

Number of Bathrooms	**1 to 1.5**			**2 to 2.5**				**3 to 3.5**			
Number of Bedrooms	1	2	3	2	3	4	5	3	4	5	6
First Hour Rating[2], Gallons	42	54	54	54	67	67	80	67	80	80	80

Notes: [1]The first hour rating is found on the "Energy Guide" label.
[2]Nonstorage and solar water heaters shall be sized to meet the appropriate first hour rating as shown in the table.
[3]For replacement water heaters, see Section 101.4.1.1.1.

502.2 Chimney – Delete definition.

502.3 Chimney, Factory-Built – Delete definition.

502.4 Chimney, Masonry – Delete definition.

502.5 Chimney, Metal – Delete definition.

502.7 Direct Vent Appliance – Delete definition.

502.8 Flue Collar – Delete definition.

502.9 Gas Vent, Type B – Delete definition.

502.10 Gas Vent, Type L – Delete definition.

502.12 Vent – Delete definition.

502.13 Vent Connector – Delete definition.

502.14 Venting System – Delete definition.

504.1 Inspection of Chimneys or Vents. Delete paragraph.

505.1 Location. Water heater installation in bedrooms and bathrooms shall comply with one of the following:

(1) Fuel-burning water heaters may be installed in a closet located in the bedroom or bathroom provided the closet is equipped with a listed, gasketed door assembly and a listed self-closing device. The self-closing door assembly shall meet the requirements of Section 505.1.1. The door assembly shall be installed with a threshold and bottom door seal and shall meet the requirements of Section 505.1.2. All combustion air for such installations shall be obtained from the outdoors in accordance with the International Mechanical Code. The closet shall be for the exclusive use of the water heater.

(2) Water heater shall be of the direct vent type.

506.2 All storage-type water heaters deriving heat from fuels or types of energy other than gas, shall be provided with, in addition to the primary temperature controls, an over-temperature safety protection device constructed, listed, and installed in accordance with nationally recognized applicable standards for such devices and a combination temperature and pressure relief valve.

507.0 Combustion Air. For issues relating to combustion air, see the Mechanical Code.

Sections 507.1 through 507.9 are not adopted.

Sections 508.6 through 508.9 are not adopted.

508.12 Delete entire section.

508.18 Venting of Flue Gases - Delete entire section.

Sections 508.20 through 508.24.5 are not adopted.

510.0 Venting of Equipment. Delete entire section.

511.0 Sizing of Category I Venting Systems. Delete entire section.

512.0 Direct Vent Equipment. Delete entire section.

Chapter 5, Part II is not adopted.

[Statutory Authority: RCW 19.27.074, 19.27.031 and chapters 19.27 and 34.05 RCW. 10-03-101, § 51-56-0500, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.190, 19.27.020 and chapters 19.27 and 34.05 RCW. 07-01-094, § 51-56-0500, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-110, § 51-56-0500, filed 12/17/03, effective 7/1/04; 02-01-114, § 51-56-0500, filed 12/18/01, effective 7/1/02.]

WAC 51-56-0600 Chapter 6—Water supply and distribution. 601.1 Except where not deemed necessary for safety or sanitation by the AHJ, each plumbing fixture shall be provided with an adequate supply of potable running water piped thereto in an approved manner, so arranged as to flush and keep it in a clean and sanitary condition without danger of backflow or cross-connection. Water closets and urinals shall be flushed by means of an approved flush tank or flushometer valve.

EXCEPTION: Listed fixtures that do not require water for their operation and are not connected to the water supply.

Kitchen sinks, lavatories, bathtubs, showers, bidets, laundry tubs and washing machine outlets shall be provided with hot and cold water. This requirement shall not supersede the requirements for individual temperature control limitations for public lavatories, bidets, bathtubs, whirlpool bathtubs and shower control valves.

603.0 Cross-Connection Control. Cross-connection control shall be provided in accordance with the provisions of this chapter. Devices or assemblies for protection of the public water system must be models approved by the department of

health under WAC 246-290-490. The authority having jurisdiction shall coordinate with the local water purveyor where applicable in all matters concerning cross-connection control within the property lines of the premises.

No person shall install any water operated equipment or mechanism, or use any water treating chemical or substance, if it is found that such equipment, mechanism, chemical or substance may cause pollution or contamination of the domestic water supply. Such equipment or mechanism may be permitted only when equipped with an approved backflow prevention device or assembly.

603.1 Approval of Devices or Assemblies. Before any device or assembly is installed for the prevention of backflow, it shall have first been approved by the authority having jurisdiction. Devices or assemblies shall be tested for conformity with recognized standards or other standards acceptable to the authority having jurisdiction. Backflow prevention devices and assemblies shall comply with Table 6-2, except for specific applications and provisions as stated in Section 603.4 through 603.4.22.

All devices or assemblies installed in a potable water supply system for protection against backflow shall be maintained in good working condition by the person or persons having control of such devices or assemblies. Such devices or assemblies shall be tested in accordance with Section 603.3.3 and WAC 246-290-490. If found to be defective or inoperative, the device or assembly shall be replaced or repaired. No device or assembly shall be removed from use or relocated or other device or assembly substituted, without the approval of the authority having jurisdiction.

Testing shall be performed by a Washington state department of health certified backflow assembly tester.

TABLE 6-2
Backflow Prevention Devices, Assemblies and Methods
The following line is deleted from the table:

Device, Assembly or Method	Applicable Standards	Pollution (Low Hazard)		Contamination (High Hazard)		Installation
		Back Siphonage	Back Pressure	Back Siphonage	Back Pressure	
Backflow preventer for carbonated beverage dispensers (two independent check valves with a vent to the atmosphere.)	ASSE 1022	X				Installation includes carbonated beverage machines or dispensers. These devices operate under intermittent or continuous pressure conditions.

603.3.3 For devices and assemblies other than those regulated by the Washington department of health in conjunction with the local water purveyor for the protection of public water systems, the authority having jurisdiction shall ensure that the premise owner or responsible person shall have the backflow prevention assembly tested by a Washington state department of health certified backflow assembly tester:

(1) At the time of installation, repair or relocation; and

(2) At least on an annual schedule thereafter, unless more frequent testing is required by the authority having jurisdiction.

603.4.6.1 Potable water supplies to systems having no pumps or connections for pumping equipment, and no chemical injection or provisions for chemical injection, shall be protected from backflow by one of the following devices:

(1) Atmospheric vacuum breaker.

(2) Pressure vacuum breaker.

(3) Spill-resistant pressure vacuum breaker.

(4) Reduced pressure backflow preventer.

(5) A double check valve may be allowed when approved by the water purveyor and the authority having jurisdiction.

603.4.10 Potable Water Make Up Connections to Steam or Hot Water Boilers shall be protected by an air gap or a reduced pressure principle backflow preventer.

603.4.12 Potable Water Supply to Carbonators shall be protected by a listed reduced pressure principle backflow preventer as approved by the authority having jurisdiction for the specific use. The backflow preventer shall be located in accordance with Section 603.3.4. The piping downstream of the backflow preventer shall not be of copper, copper alloy, or other material that is affected by carbon dioxide.

603.4.14 Backflow preventers shall not be located in any area containing fumes or aerosols that are toxic, poisonous, infectious, or corrosive.

603.4.16.1 Except as provided under Sections 603.4.16.2 and 603.4.16.3, potable water supplies to fire protection systems that are normally under pressure, including but not limited to standpipes and automatic sprinkler systems, except in one or two family residential flow-through or combination sprinkler systems piped in materials approved for potable water distribution systems, shall be protected from back-pressure and back-siphonage by one of the following testable devices:

1. Double check valve assembly.
2. Double check detector assembly.
3. Reduced pressure backflow preventer.
4. Reduced pressure detector assembly.

Potable water supplies to fire protection systems that are not normally under pressure shall be protected from backflow

and shall meet the requirements of the appropriate standard(s) referenced in Table 14-1.

604.15 Plastic water service piping may terminate within a building, provided the connection to the potable water distribution system shall be made as near as is practical to the point of entry and shall be accessible. Barbed insert fittings with hose clamps are prohibited as a transition fitting within the building.

608.5 Relief valves located inside a building shall be provided with a drain, not smaller than the relief valve outlet, of galvanized steel, hard drawn copper piping and fittings, CPVC, or listed relief valve drain tube with fittings which will not reduce the internal bore of the pipe or tubing (straight lengths as opposed to coils) and shall extend from the valve to the outside of the building, with the end of the pipe not more than two (2) feet (610 mm) nor less than six (6) inches (152 mm) above the ground or the flood level of the area receiving the discharge and pointing downward. Such drains may terminate at other approved locations. No part of such drain pipe shall be trapped or subject to freezing. The terminal end of the drain pipe shall not be threaded.

EXCEPTION: Replacement water heating equipment shall only be required to provide a drain pointing downward from the relief valve to extend between two feet (610 mm) and six inches (152 mm) from the floor. No additional floor drain need be provided.

610.4 Systems within the range of Table 6-6 may be sized from that table or by the method set forth in Section 610.5.

Listed parallel water distribution systems shall be installed in accordance with their listing.

[Statutory Authority: RCW 19.27.074, 19.27.031 and chapters 19.27 and 34.05 RCW. 10-03-101, § 51-56-0600, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.190, 19.27.020 and chapters 19.27 and 34.05 RCW. 07-01-094, § 51-56-0600, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-110, § 51-56-0600, filed 12/17/03, effective 7/1/04; 02-01-114, § 51-56-0600, filed 12/18/01, effective 7/1/02.]

WAC 51-56-0700 Chapter 7—Sanitary drainage.

701.1.2 ABS and PVC DWV piping installations shall be installed in accordance with applicable standards in Table 14-1. Except for individual single family dwelling units, materials exposed within ducts or plenums shall have a flame-spread index of not more than 25 and a smoke developed index of not more than 50, when tested in accordance with the Test for Surface-Burning Characteristics of the Building Materials (See the Building Code standards based on ASTM E-84 and ANSI/UL 723).

704.3 Except where specifically required to be connected indirectly to the drainage system, or when first approved by the authority having jurisdiction, all plumbing fixtures, drains, appurtenances, and appliances shall be directly connected to the drainage system of the building or premises.

710.3 The minimum size of any pump or any discharge pipe from a sump having a water closet connected thereto shall be not less than two (2) inches (52 mm).

Sections 710.3.1 through 710.3.3 are not adopted.

CHAPTER 7, PART II—BUILDING SEWERS

Part II Building Sewers. Delete all of Part II (Sections 713 through 723, and Tables 7-7 and 7-8).

[Statutory Authority: RCW 19.27.074, 19.27.031 and chapters 19.27 and 34.05 RCW. 10-03-101, § 51-56-0700, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.190, 19.27.020 and chapters 19.27 and 34.05 RCW. 07-01-094, § 51-56-0700, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.031, 19.27.074. 02-01-114, § 51-56-0700, filed 12/18/01, effective 7/1/02.]

WAC 51-56-0900 Chapter 9—Vents.

903.1.2 ABS and PVC DWV piping installations shall be installed in accordance with applicable standards in Table 14-1. Except for individual single family dwelling units, materials exposed within ducts or plenums shall have a flame-spread index of not more than 25 and a smoke developed index of not more than 50, when tested in accordance with the Test for Surface-Burning Characteristics of the Building Materials (see the Building Code standards based on ASTM E-84 and ANSI/UL 723).

908.2.1 Where Permitted. Water closets, bathtubs, showers, bidets, and floor drains within one or two bathroom groups located on the same floor level and for private use shall be permitted to be vented by a wet vent. The wet vent shall be considered the vent for the fixtures and shall extend from the connection of the dry vent along the direction of the flow in the drain pipe to the most downstream fixture drain or trap arm connection to the horizontal branch drain. Each wet-vented fixture drain or trap arm shall connect independently to the wet-vented horizontal branch drain. Each individual fixture drain or trap arm shall connect horizontally to the wet-vented horizontal branch drain or shall be provided with a dry vent. The trap to vent distance shall be in accordance with Table 10-1. Only the fixtures within the bathroom groups shall connect to the wet-vented horizontal branch drain. The water closet fixture drain or trap arm connection to the wet vent shall be downstream of any fixture drain or trap arm connections. Any additional fixtures shall discharge downstream of the wet-vent system and be conventionally vented.

[Statutory Authority: RCW 19.27.074, 19.27.031 and chapters 19.27 and 34.05 RCW. 10-03-101, § 51-56-0900, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.190, 19.27.020 and chapters 19.27 and 34.05 RCW. 07-01-094, § 51-56-0900, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.031, 19.27.074. 02-01-114, § 51-56-0900, filed 12/18/01, effective 7/1/02.]

WAC 51-56-1300 Chapter 13—Health care facilities and medical gas and vacuum systems.

Part II Medical Gas and Vacuum Systems

1309.0 Scope.

1309.1 The provisions herein shall apply to the design, installation, testing, and verification of medical gas, medical vacuum systems, and related permanent equipment in hospitals, clinics, and other heath care facilities.

1309.2 The purpose of this chapter is to provide minimum requirements for the design, installation, testing and verification of medical gas, medical vacuum systems, and related

permanent equipment, from the central supply system to the station outlets or inlets.

1313.3 Minimum Station Outlets/Inlets. Station outlets and inlets for medical gas and medical vacuum systems for facilities licensed or certified by Washington state department of health (DOH) or Washington state department of social and health services (DSHS) shall be provided as listed in chapter 246-320 WAC as required by the applicable licensing rules as applied by DOH construction review services. All other medical gas and medical vacuum systems shall be provided as listed in Table 13-3.

1328.0 System Verification.

1328.1 Prior to any medical gas system being placed in service, each and every system shall be verified as described in section 1328.2.

1328.1.1 Verification tests shall be performed only after all tests required in section 1327.0, Installer Performed Tests, have been completed.

Testing shall be conducted by a party technically competent and experienced in the field of medical gas and vacuum pipeline testing and meeting the requirements of ANSI/ASSE Standard 6030, Medical Gas Verifiers Professional Qualifications Standard.

Testing shall be performed by a party other than the installing contractor or material vendor.

When systems have been installed by in-house personnel, testing shall be permitted by personnel of that organization who meet the requirements of this section.

[Statutory Authority: RCW 19.27.074, 19.27.031 and chapters 19.27 and 34.05 RCW. 10-03-101, § 51-56-1300, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.190, 19.27.020 and chapters 19.27 and 34.05 RCW. 07-01-094, § 51-56-1300, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-110, § 51-56-1300, filed 12/17/03, effective 7/1/04; 02-01-114, § 51-56-1300, filed 12/18/01, effective 7/1/02.]

WAC 51-56-1400 Chapter 14—Referenced standards.

TABLE 14-1
Standards for Materials, Equipment, Joints and Connections

Where more than one standard has been listed for the same material or method, the relevant portions of all such standards shall apply.

Add the following standard to those listed in Table 14-1:

Standard Number	Standard Title	Application
WAC 246-290-490	Washington State Department of Health Cross-connection Control Requirements	Backflow Protection

[Statutory Authority: RCW 19.27.074, 19.27.031 and chapters 19.27 and 34.05 RCW. 10-03-101, § 51-56-1400, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.190, 19.27.020 and chapters 19.27 and 34.05 RCW. 07-01-094, § 51-56-1400, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-110, § 51-56-1400, filed 12/17/03, effective 7/1/04; 02-01-114, § 51-56-1400, filed 12/18/01, effective 7/1/02.]

WAC 51-56-1600 Chapter 16—Gray water systems.

Part I, Gray Water Systems, is not adopted. Gray water shall not be used for irrigation except as permitted by the department of health rules.

Part II

1613. Nonpotable Reuse Water Systems—General.

(A) The provisions of Part II of this chapter shall apply to the installation, construction, alteration, and repair of nonpotable reuse water intended to supply uses such as water closets, urinals, and trap primers for floor drains, and floor sinks, irrigation, industrial processes, water features and other uses approved by the Authority Having Jurisdiction. Potable water supplied as makeup water in these systems shall be protected against back-pressure and backsiphonage in accordance with Sections 602.0 and 603.0.

(B) No permit for any nonpotable reuse water system shall be issued until complete plumbing plans, with appropriate data satisfactory to the Authority Having Jurisdiction, have been submitted and approved. No changes or connections shall be made to either the nonpotable water system or the potable water system within any site containing a nonpotable reuse water system without approval by the Authority Having Jurisdiction.

(C) Before the building is occupied, the installer shall perform the initial cross-connection test in the presence of the Authority Having Jurisdiction and other authorities having jurisdiction. The test shall be ruled successful by the Authority Having Jurisdiction before final approval is granted.

(D) A nonpotable reuse water system shall be designed by a person registered or licensed to perform plumbing design work.

1614.0 Definitions. Nonpotable reuse water shall include the following:

Reclaimed Water - Water derived in any part from wastewater with a domestic wastewater component that has been adequately and reliably treated, so that it can be used for beneficial purposes. Reclaimed water is not considered a wastewater (RCW 90.46.010);

Greywater or Gray Water - Domestic type flows from bathtubs, showers, bathroom sinks, washing machines, dishwashers, and kitchen or utility sinks. Gray water does not include flow from a toilet or urinal (RCW 90.46.010); and

Other nonpotable wastewater sources from appliances and fixtures excluding wastewater streams containing black water.

For rainwater harvesting, see Part III.

1615.0 Permit. It shall be unlawful for any person to construct, install, alter, or cause to be constructed, installed, or altered any nonpotable reused water system within a building or on a premises without first obtaining a permit to do such work from the Authority Having Jurisdiction.

1616.0 Drawings and Specifications. The Authority Having Jurisdiction shall be permitted to require any or all of the

following information to be included with or in the plot plan before a permit is issued for a nonpotable reused water system.

(A) A plot plan drawn to scale and completely dimensioned, showing lot lines and structures, location of present and proposed potable water supplies and meters, water wells, streams, auxiliary water supply and systems, nonpotable reused water supply and meters, drain lines, and locations of private sewage disposal systems and 100 percent expansion areas or building sewer connected to the public sewer.

(B) Details of construction including riser diagrams or isometrics and a full description of the complete installation, including installation methods, construction, and materials as required by the Authority Having Jurisdiction. To the extent permitted by structural conditions, nonpotable reused water risers within the toilet room, including appurtenances such as air/vacuum relief valves, pressure reducing valves, etc., shall be installed in the opposite end of the room containing the served fixtures from the potable water risers or opposite walls, as applicable. To the extent permitted by structural conditions, nonpotable reused water headers and branches off risers shall not be run in the same wall or ceiling cavity of the toilet room where potable water piping is run.

(C) Detailed initial and annual testing requirements as outlined elsewhere in this chapter.

1617.0 Pipe Material/Pipe Identification. Nonpotable reused water systems shall comply with Sections 1617.1 and 1617.2.

1617.1 Pipe Materials. Reclaimed water and nonpotable water reuse pipe, valves and fittings shall conform to the requirements of Sections 604.0, 605.0 and 606.0.

1617.2 Color and Information.

1617.2.1 Reclaimed Water. Reclaimed water systems shall have a purple background with black uppercase lettering with the words "CAUTION: RECLAIMED WATER, DO NOT DRINK." The minimum size of the letters and length of the color field shall conform to Table 6-1. Where used, a colored identification band shall be indicated every twenty feet (6,096 mm) not less than once per room, and shall be visible from the floor level. Marking is not required for pipe manufactured with purple color integral to the pipe and marked with black uppercase lettering to read "CAUTION: NONPOTABLE RECLAIMED WATER, DO NOT DRINK" in intervals not to exceed five feet (1,524 mm). All valves, except fixture supply control valves shall be equipped with a locking feature. All mechanical equipment that is appurtenant to the reclaimed water system shall be painted purple.

1617.2.2 Other Nonpotable Reused Water. Except as noted in Section 1617.2.1, nonpotable water systems shall have a yellow background with black uppercase lettering, with the words "CAUTION: NONPOTABLE WATER, DO NOT DRINK." Each nonpotable system shall be identified to designate the liquid being conveyed, and the direction of normal flow shall be clearly shown. The minimum size of the letters and length of the color field shall conform to Table 6-1.

The background color and required information shall be indicated every twenty feet but not less than once per room, and shall be visible from the floor level. Where concealed within construction, the piping shall be labeled on two opposing sides of the pipe within each stud or joist bay.

1618.0 Installation.

1618.1 Collection Reservoir. Nonpotable reuse water shall be collected in an approved reservoir constructed of durable, nonabsorbent and corrosion-resistant materials. The reservoir shall be a closed and gas-tight vessel. Access openings shall be provided to allow inspection and cleaning of the reservoir interior. The reservoir shall be sized to limit the retention time of nonpotable reuse water to a maximum of seventy-two hours.

1618.1.1 Filtration. Nonpotable reuse water entering the reservoir shall pass through an approved filter such as a media, sand or diatomaceous earth filter.

1618.1.2 Required Valve. A full-open valve shall be installed downstream of the last fixture connection to the nonpotable reuse water discharge pipe before entering the required filter.

1618.1.3 Overflow. The collection reservoir shall be equipped with an overflow pipe of the same diameter as, or larger than, the influent pipe for the nonpotable reuse water. The overflow shall be indirectly connected to the sanitary drainage system.

1618.1.4 Drain. A drain shall be located at the lowest point of the collection reservoir and shall be indirectly connected to the sanitary drainage system. The drain shall be the same diameter as the overflow pipe required in Section 1618.1.3.

1618.1.5 Disinfection. Nonpotable reuse water shall be disinfected by an approved method that uses one or more disinfectants such as chlorine, iodine or ozone.

1618.1.6 Makeup Water. Potable water shall be supplied as a source of makeup water for nonpotable water systems that serve plumbing fixtures. The potable supply shall be protected against backflow in accordance with Chapter 6. A full-open valve shall be located on the makeup water supply line to the collection reservoir.

(A) Hose bibbs shall not be allowed on nonpotable reuse water piping systems.

(B) The nonpotable reuse water system and the potable water system within the building shall be provided with the required appurtenances (valves, air/vacuum relief valves, etc.,) to allow for deactivation or drainage as required by this chapter for a cross-connection test in Section 1620.0.

(C) Nonpotable reuse water pipes shall not be run or laid in the same trench as potable water pipes. A ten foot (3,048 mm) horizontal separation shall be maintained between pressurized, buried reclaimed and potable water piping. Buried potable water pipes crossing pressurized nonpotable reuse water pipes shall be laid not less than twelve inches (305 mm) above the nonpotable reuse water pipes. Nonpotable reuse water pipes laid in the same trench or crossing building sewer or drainage piping shall be installed in compliance with Sections 609.0 and 720.0 of this code. Nonpotable reuse water pipes shall be protected similar to potable water pipes.

1619.0 Signs.

1619.1 Commercial, Industrial and Institutional Room Entrance Signs. In commercial, industrial, and institutional occupancies, all rooms using nonpotable reuse water for water closets and/or urinals shall be identified with signs. Each sign shall contain one-half inch (12.7 mm) letters of a highly visible color on a contrasting background. The location of the sign(s) shall be such that the sign(s) shall be visible to all users. The number and location of the signs shall be approved by the Authority Having Jurisdiction and shall contain the following text:

**TO CONSERVE WATER,
THIS BUILDING USES RECLAIMED WATER TO FLUSH TOILETS AND URINALS.**

1619.2 Equipment Room Signs. Each room containing nonpotable reuse water equipment shall have a sign posted with the following wording in one-inch (25.4 mm) letters on a purple background:

**CAUTION
NONPOTABLE RECLAIMED WATER, DO NOT DRINK.
DO NOT CONNECT TO DRINKING WATER SYSTEM.
NOTICE
CONTACT BUILDING MANAGEMENT BEFORE PERFORMING ANY WORK ON THIS WATER SYSTEM.**

This sign shall be posted in a location that is visible to anyone working on or near nonpotable reuse water equipment.

1619.3 Where water closets and/or urinals are flushed with nonpotable reuse water, the fixture shall be labeled:

**CAUTION
TO CONSERVE WATER, THIS BUILDING USES NONPOTABLE RECLAIMED WATER TO FLUSH TOILETS AND URINALS**

1619.4 Valve Access Door Signs. Each nonpotable reuse water valve within a wall shall have its access door into the wall equipped with a warning sign approximately six inches by six inches (152 mm x 152 mm) with wording in one-half inch (12.7 mm) letters on a purple background. The size, shape, and format of the sign shall be substantially the same as that specified in subsection (B) above. The signs shall be attached inside the access door frame and shall hang in the center of the access door frame. This sign requirement shall be applicable to any and all access doors, hatches, etc., leading to nonpotable reuse water piping and appurtenances.

1620.0 Inspection and Testing.

1620.1 Nonpotable reuse water piping shall be inspected and tested as outlined in this code for testing of potable water piping.

1620.2 An initial and subsequent annual inspection and test shall be performed on both the potable and nonpotable reuse water systems. The potable and nonpotable reuse water systems shall be isolated from each other and independently inspected and tested to ensure there is no cross-connection as follows:

1620.2.1 Visual Dual System Inspection. Prior to commencing the cross-connection testing, a dual system inspection shall be conducted by the Authority Having Jurisdiction and other authorities having jurisdiction.

(i) Meter locations of the nonpotable reuse water and potable water lines shall be checked to verify that no modifications were made, and that no cross-connections are visible.

(ii) Pumps and equipment, equipment room signs, and exposed piping in the equipment room shall be checked.

(iii) Valves shall be checked to ensure that valve lock seals are still in place and intact. Valve control door signs shall be checked to verify that no signs have been removed.

1620.2.2 Cross-Connection Test. The following procedure shall be followed by the applicant in the presence of the Authority Having Jurisdiction and other authorities having jurisdiction to determine whether a cross connection occurred.

(i) The potable water system shall be activated and pressurized. The nonpotable reuse water system shall be shut down and completely drained.

(ii) The potable water system shall remain pressurized for a minimum period of time specified by the Authority Having Jurisdiction while the nonpotable reuse water system is empty. The minimum period the nonpotable reuse water system is to remain depressurized shall be determined on a case-by-case basis, taking into account the size and complexity of the potable and nonpotable reuse water distribution systems, but in no case shall that period be less than one hour.

(iii) Fixtures, potable and reclaimed, shall be tested and inspected for flow. Flow from any nonpotable reuse water system outlet shall indicate a cross-connection. No flow from a potable water outlet would indicate that it is connected to the nonpotable reuse water system.

(iv) The drain on the nonpotable reuse water system shall be checked for flow during the test and at the end of the period.

(v) The potable water system shall then be completely drained.

(vi) The nonpotable reuse water system shall then be activated and pressurized.

(vii) The nonpotable reuse water system shall remain pressurized for a minimum period of time specified by the Authority Having Jurisdiction while the potable water system is empty. The minimum period the potable water system is to remain depressurized shall be determined on a case-by-case basis, but in no case shall that period be less than one hour.

(viii) Fixtures, potable and reclaimed, shall be tested and inspected for flow. Flow from any potable water system outlet shall indicate a cross-connection. No flow from a nonpotable reuse water outlet would indicate that it is connected to the potable water system.

(ix) The drain on the potable water system shall be checked for flow during the test and at the end of the period.

(x) If there is no flow detected in any of the fixtures that would have indicated a cross-connection, the potable water system shall be repressurized.

1620.2.3 Cross-Connection Discovered. The following procedure, in the presence of the Authority Having Jurisdiction, shall be activated immediately:

(i) Nonpotable reuse water piping to the building shall be shut down at the meter, and the nonpotable reuse water riser shall be drained.

(ii) Potable water piping to the building shall be shut down at the meter.

(iii) The cross-connection shall be uncovered and disconnected.

(iv) The building shall be retested following procedures listed in subsections (B)(1) and (2) above.

(v) The potable water system shall be chlorinated with fifty ppm chlorine for twenty-four hours.

(vi) The potable water system shall be flushed after twenty-four hours, and a standard bacteriological test shall be performed. If test results are acceptable, the potable water system shall be permitted to be recharged.

1620.3 An annual inspection of the nonpotable reuse water system, following the procedures listed in subsection 1620.0 (B)(1), shall be required. Annual cross-connection testing, following the procedures listed in subsection 1620.0 (B)(2), shall be required by the Authority Having Jurisdiction, unless site conditions do not require it. In no event shall the test occur less often than once in four years. Alternate testing requirements shall be permitted by the Authority Having Jurisdiction.

1621.0 Sizing. Nonpotable reuse water piping shall be sized as outlined in this code for sizing potable water piping.

1622.0 Abandonment of Nonpotable Reuse Water Systems. Where nonpotable reuse water systems are abandoned, the procedure for abandonment shall be as required by the Authority Having Jurisdiction. Components of the abandoned system, including, but not limited to, pipe, tubing, fittings and valves shall not be used for potable water systems.

Part III

1623.0 Rainwater Harvesting Systems - General. All components of the system not specifically addressed by the provisions of Part III of this chapter shall meet all applicable sections of this code, and any applicable manufacturer's installation instructions.

Engineered systems shall be installed per plans and specifications of the engineer of record.

1624.0 Scope. Applications for rainwater harvesting are unique for each application. For this reason, each rainwater harvesting system proposed for use must be engineered and site-specific and are subject to the approval of the Authority Having Jurisdiction. The requirement for the system to be engineered may be waived by the Authority Having Jurisdiction.

1624.1 Water Uses. Harvested rainwater uses may include water closets, urinals, hose bibbs, industrial applications, and irrigation purposes. Other uses may be allowed when first approved by the Authority Having Jurisdiction.

1625.0 Definitions. In addition to other definitions used in the Uniform Plumbing Code, the following definitions apply to rainwater harvesting systems.

1625.1 Auxiliary Supply. The piping arranged and protected from contamination to provide an alternate means of filling a cistern.

1625.2 Cistern. The central storage component of the rainwater harvesting system. Protection and maintenance of the cistern is essential for the health of the system.

1625.3 Debris Excluder. A screen or other device installed on the gutter or downspout system to prevent the accumulation of leaves, needles, or other debris in the system.

1625.4 Flat. Having a slope no greater than 1 in 50.

1625.5 Piping System. The system of pipes that conveys the harvested rainwater and distributes it to various fixtures.

1625.6 Prefiltration. A device to mechanically remove sediment and debris.

1625.7 Pump or Pressure System. The mechanical device necessary to distribute the harvested rainwater from the cistern to the designated fixtures.

1625.8 Rainwater Harvesting System (RWS). A cistern(s), pipe, fittings, pumps and other plumbing appurtenances required for and/or used to harvest and distribute rainwater.

1625.9 Return Elbow. A section of pipe with a 180-degree bend.

1625.10 Roof Drainage System. The roof drains, overflow drains, scuppers, gutters and downspouts used to convey the rainwater from the roof surface to the system.

1625.11 Roof Surface. The surface rainwater harvesting systems rely on for the collection of rainwater that has fallen on a building roof.

1625.12 Roof Wash or Roof Washer. A device or method for removal of sediment and debris from collected roof water by diverting initial rainfall from entry into the cistern(s).

1625.13 Screen. Corrosion resistant wire or other approved mesh having openings in determined sizes.

1625.14 Slope or Sloping. Having a slope greater than 1 in 50.

1625.15 Transfer Pump. The mechanical device to transfer collected water from downspouts to remote cistern(s).

1626.0 Permit. It shall be unlawful for any person to construct, install, alter, or cause to be constructed, installed, or altered any rainwater harvesting system within a building or on a premises without first obtaining a permit to do such work from the Authority Having Jurisdiction.

In addition to the permits required by this Code, the following additional permits may be required for the installation of a rainwater harvesting system: An electrical permit for the pump or other electrical controls; a building permit for cistern footings, foundations, enclosures and roof structures; a grading permit may be necessary for underground tanks. In addition, contact your regional office of the department of ecology regarding a registration form.

1626.1 Application. The following information must be provided with each permit application for a rainwater harvesting system:

1. Site or plot plan, including site elevations.

2. A diagram of the rainwater harvesting system (including piping and equipment) and domestic potable water systems, including sizing and dimensions.

3. Specifications and manufacturer's installation instructions for cistern(s), pump(s), filtration and/or disinfection, and roof washing or pre-filtration system(s).

4. Engineering. Installation, including, but not limited to, the following systems, will require structural engineering: Cisterns that are located on top of a building structure or cisterns that are located on sloping sites.

Information in addition to that listed above may be necessary in some instances. The size and complexity of the building, site and system will determine the necessity for additional information.

1627.0 General Provisions. A rainwater harvesting system begins at the point of collection and terminates as waste after the water collected has been used in plumbing fixtures, industrial applications, or used for irrigation purposes. The parts of the collection and distribution system include the roof surface, gutters and downspouts, roof washer, cistern, pump and the piping system.

1627.1 Collection System. Rainwater shall only be harvested from roof surfaces. Harvest shall not occur from the following locations:

1. Any vehicular or pedestrian area;
2. Surface water runoff; or
3. Bodies of standing water.

1627.2 Collection Pretreatment. Rainwater harvested from roof surfaces shall be pretreated by either a roof washing system or other filtration system of no more than 50 microns. The quantity of the first flush generated by the rainwater harvesting system during any rain event shall be calculated as the first 0.02 inch of rainfall per 24-hour period per square foot of roof area and shall be diverted away from the cistern. Discharge of any diverted water shall go to a location approved by the Administrative Authority.

EXCEPTIONS: 1. A first flush is not required where a post storage filtration or treatment system is installed and approved by the Administrative Authority.
2. A first flush is not required for systems used exclusively for irrigation purposes.

1628.0 System Components.

1628.1 Roof Surface. The roof surface may be constructed of any material accepted by the Administrative Authority.

EXCEPTION: Copper, zinc or lead roofing materials shall not be used.

1628.2 Roof Drainage System. Gutters and downspouts used to collect rainwater shall comply with the following:

1. Gutters and downspouts may be manufactured of any material. Gutter and downspout materials are not required to meet material specifications found in the Uniform Plumbing Code.

EXCEPTION: Copper or zinc gutters and downspouts shall not be used. If existing gutters and downspouts are already in place, the interior shall be coated with a NSF-quality epoxy paint.

2. Gutter and downspout systems leading to the cistern shall be fitted with debris excluders.

1628.3 Roof Washers and Prefiltration. All rainwater harvesting systems using impervious roof surfaces shall have at least one roof washer per downspout or prefiltration system. A roof washer or prefiltration system is not required for pervious roof surfaces such as green roofs. Roof washers and prefiltration systems shall meet the following design requirements.

1628.3.1 All collected rainwater shall pass through a roof washer or prefiltration system before the water enters the cistern(s).

1628.3.2 If more than one cistern is used, a roof washer or prefiltration system shall be provided for each cistern.

EXCEPTION: Where a series of cisterns are interconnected to supply water to a single system.

1628.3.3 The following requirements apply to all roof washers.

1628.3.3.1 The inlet to the roof washer shall be provided with a debris screen that protects the roof washer from the intrusion of waste and vermin.

1628.3.3.2 The roof washer shall rely on manually operated valves or other devices to do the diversion.

1628.3.3.8 Roof washers shall be readily accessible for regular maintenance.

1628.3.4 Prefiltration screens or filters shall be maintained consistent with manufacturer's specifications.

1628.4 Cisterns. The following are the minimum requirements for cisterns.

1628.4.1 General.

1628.4.1.1 All cisterns shall be listed for use with potable water.

1628.4.1.2 Cisterns shall be capable of being filled from both the rainwater harvesting system and the public or private water system.

1628.4.1.3 The municipal or on-site well water system shall be protected from cross-contamination in accordance with Section 603.4.5.

1628.4.1.4 Backflow assemblies shall be maintained and tested in accordance with Section 603.3.3.

1628.4.1.5 Cisterns may be used as storm water collection points that help to minimize flood damage, while providing a reservoir for later use.

1628.4.1.6 Cisterns shall have access to allow inspection and cleaning.

1628.4.2 Size. Any cistern, or combination of cisterns used, shall be sized adequately for the intended use of the water.

1628.4.2.1 For above grade cisterns, the ratio of the cistern size shall not be greater than 1:1 height to width, provided that for an engineered tank with an engineered foundation, the height may exceed the width, subject to approval of the Authority Having Jurisdiction. The ratio for below grade cisterns is not limited.

1628.4.3 Location. Cisterns may be installed either above or below grade. All cisterns shall be installed in accordance with the manufacturer's installation instructions. Where the installation requires a foundation, the foundation shall be flat and shall be capable of supporting the cistern weight when the cistern is full.

1628.4.3.1 Below Grade Cisterns. Below grade cisterns shall be provided with manhole risers a minimum of 8 inches above surrounding grade. Underground cisterns shall have tiedowns per manufacturer's specifications, or the excavated site must have a daylight drain or some other drainage mechanism to prevent floating of the cistern resulting from elevated groundwater levels.

1628.4.4 Protection. Cisterns shall be protected from sunlight to inhibit algae growth and ensure life expectancy of tank.

1628.4.5 Inlets, Outlets and Openings. All cistern openings shall be protected from unintentional entry by humans or vermin. Manhole covers shall be provided and shall be secured to prevent tampering. Where an opening is provided that could allow the entry of personnel, the opening shall be marked, "DANGER - CONFINED SPACE."

Cistern outlets shall be located at least 4 inches above the bottom of the cistern.

1628.4.6 Overflow. The cistern shall be equipped with an overflow device.

1628.4.6.1 The overflow device shall consist of a pipe equal to or greater than the cistern inlet and a minimum of 4 inches below any makeup device from other sources.

1628.4.6.2 The overflow outlet shall be protected with a screen having openings no greater than 0.25 inches or a self-sealing cover.

1628.4.6.3 The Authority Having Jurisdiction shall approve the discharge location of the overflow water.

1628.5 Pump. Where a pump is provided in conjunction with the rainwater harvesting system, the pump shall meet the following provisions.

1628.5.1 The pump and all other pump components shall be listed and approved for use with potable water systems.

1628.5.2 The pump shall be capable of delivering a minimum of 15 psi residual pressure at the highest outlet served. Minimum pump pressure shall allow for friction and other pressure losses. Maximum pressures shall not exceed 80 psi.

1628.6 Piping.

1628.6.1 There shall be no direct connection of any rainwater harvesting pipe system and any domestic potable water pipe system.

1628.6.2 Materials. Pipe used to convey harvested rainwater shall be identified per Section 601.2 and Table 6-1. Fittings and other system components shall be listed for use in conjunction with specified piping. Both piping and fittings shall be installed as required by applicable code and standards.

1628.6.2.1 All other products entering into the construction of a rainwater harvesting system shall be listed as required by code for the purpose intended, and suitable for use in a potable water system.

1628.6.3 Color and Information. All rainwater pipe shall be marked "CAUTION: NONPOTABLE RAINWATER, DO NOT DRINK" every four feet along its length, but in no case less than once per room. The pipe and lettering shall comply with Section 601.2. Where concealed within construction, the piping shall be labeled on two opposing sides of the pipe within each stud or joist bay.

1629.0 Signs.

1629.1 Commercial, Industrial and Institutional Room Entrance Signs. In commercial, industrial, and institutional occupancies, all rooms using nonpotable reuse water for water closets and/or urinals shall be identified with signs. Each sign shall contain one-half inch (12.7 mm) letters of a highly visible color on a contrasting background. The location of the sign(s) shall be such that the sign(s) shall be visible to all users. The number and location of the signs shall be approved by the Authority Having Jurisdiction and shall contain the following text:

**TO CONSERVE WATER,
THIS BUILDING USES RAINWATER TO FLUSH TOILETS AND URINALS.**

1629.2 Equipment Room Signs. Each room containing nonpotable reuse water equipment shall have a sign posted with the following wording in one-inch (25.4 mm) letters of a highly visible color on a contrasting background:

**CAUTION
NONPOTABLE RAINWATER, DO NOT DRINK.
DO NOT CONNECT TO DRINKING WATER SYSTEM.
NOTICE
CONTACT BUILDING MANAGEMENT
BEFORE PERFORMING ANY WORK ON THIS WATER SYSTEM.**

This sign shall be posted in a location that is visible to anyone working on or near nonpotable reuse water equipment.

1629.3 Every water closet or urinal supply, hose bibb or irrigation outlet shall be permanently identified with an indelibly marked placard stating:

**CAUTION
NONPOTABLE RAINWATER, DO NOT DRINK**

1630.0 Inspection and Testing.

(A) Rainwater harvesting systems shall be inspected and tested as outlined in this code for testing of potable water piping.

(B) An initial inspection and test shall be performed on both the potable and rainwater harvesting systems. The potable and rainwater system shall be isolated from each other and independently inspected and tested to ensure there is no cross-connection.

1631.0 System Maintenance. Rainwater harvesting systems shall be maintained in functioning order for the life of the system. It is the property owner's responsibility to maintain

the system until the system is abandoned as prescribed in this code.

1632.0 System Abandonment. If the owner of a rainwater harvesting system elects to cease use of, or fails to properly maintain such system, they shall abandon the system. To abandon the system one shall:

1. Remove the system entirely; and

2. Replace the rainwater harvesting pipe system with an approved potable water supply pipe system. Where an existing potable pipe system is already in place, fixtures may be reconnected to the existing system.

Rainwater harvesting system abandonment and potable water installations require permit, inspection(s) and approval(s).

[Statutory Authority: RCW 19.27.074, 19.27.031 and chapters 19.27 and 34.05 RCW. 10-03-101, § 51-56-1600, filed 1/20/10, effective 7/1/10. Statutory Authority: RCW 19.27.190, 19.27.020 and chapters 19.27 and 34.05 RCW. 07-01-094, § 51-56-1600, filed 12/19/06, effective 7/1/07.]

Chapter 51-57 WAC

STATE BUILDING CODE ADOPTION AND AMENDMENT OF APPENDIX A, B AND APPENDIX I OF THE 2009 EDITION OF THE UNIFORM PLUMBING CODE

WAC

51-57-003 Uniform Plumbing Code Standards.
51-57-008 Implementation.

WAC 51-57-003 Uniform Plumbing Code Standards. The 2009 edition of the Uniform Plumbing Code Standards (Appendixes A, B and I), published by the International Association of Plumbing and Mechanical Officials are hereby adopted by reference.

[Statutory Authority: RCW 19.27.074, 19.27.031, and chapters 19.27 and 34.05 RCW. 10-04-003, § 51-57-003, filed 1/21/10, effective 7/1/10. Statutory Authority: RCW 19.27.190, 19.27.020 and chapters 19.27 and 34.05 RCW. 07-03-043, § 51-57-003, filed 1/11/07, effective 7/1/07. Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-110, § 51-57-003, filed 12/17/03, effective 7/1/04; 02-01-114, § 51-57-003, filed 12/18/01, effective 7/1/02.]

WAC 51-57-008 Implementation. The Uniform Plumbing Code Standards adopted by chapter 19.27 RCW shall become effective in all counties and cities of this state on July 1, 2010, unless local government residential amendments have been approved by the state building code council.

[Statutory Authority: RCW 19.27.074, 19.27.031, and chapters 19.27 and 34.05 RCW. 10-04-003, § 51-57-008, filed 1/21/10, effective 7/1/10. Statutory Authority: RCW 19.27.190, 19.27.020 and chapters 19.27 and 34.05 RCW. 07-03-043, § 51-57-008, filed 1/11/07, effective 7/1/07. Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-110, § 51-57-008, filed 12/17/03, effective 7/1/04; 02-01-114, § 51-57-008, filed 12/18/01, effective 7/1/02.]